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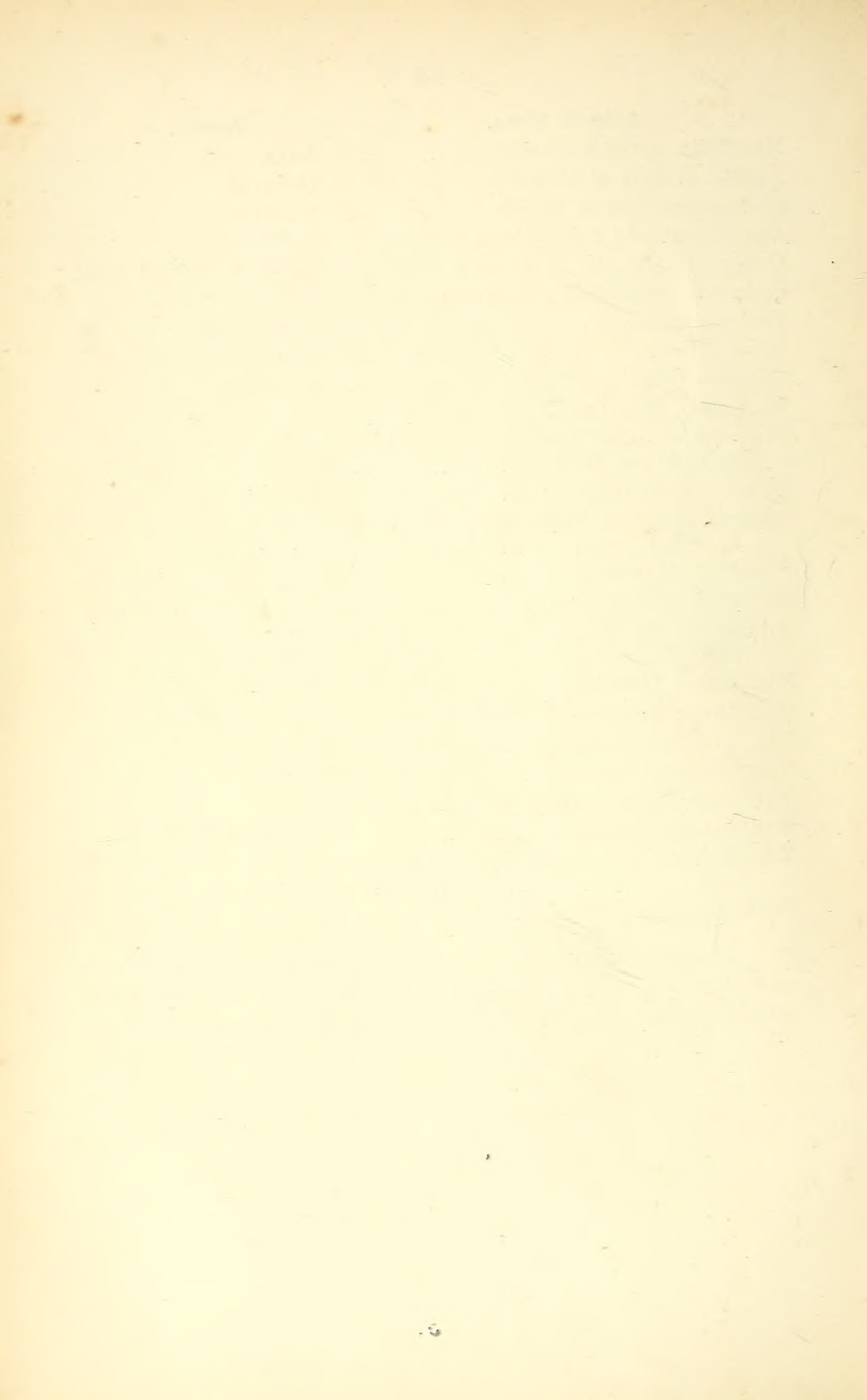
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THE SOUTH LONDON
Entomological & Natural History Society,

(Established 1872)

1, DENMAN STREET, RAILWAY APPROACH,
LONDON BRIDGE, S.E.

Patrons.

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M.P., F.R.S., F.L.S., F.E.S.	F.L.S., F.E.S.
HENRY T. STAINTON, Esq., F.R.S., F.L.S., F.E.S.	

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Elected December 17th, 1885.

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Vice-President.

J. JENNER WEIR, F.L.S., F.Z.S., F.E.S.

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Hon. Secretaries.

H. W. BARKER.

* WALTER A. PEARCE, Lyndhurst, Croxted Road, West Dulwich.

** To whom all Communications should be addressed.*

1885.

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❖ THE SOUTH LONDON ❖
ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,

1, DENMAN STREET, RAILWAY APPROACH, LONDON BRIDGE, S.E.

The Society has for its object the diffusion of Biological Science, by means of papers and discussions, and the formation of typical collections. There is a Library for the use of Members. Meetings of the Members are held on the 1st and 3rd Thursday evenings in each month, from Eight to Ten p.m., at the above address. The Society's rooms are easy of access from all parts of London, and the Council cordially invite the co-operation of all naturalists, especially those who are willing to further the objects of the Society by reading papers and exhibiting their specimens.

SUBSCRIPTION.

*Seven Shillings and Sixpence per Annum, with an Entrance
Fee of Two Shillings and Sixpence.*

All communications to be addressed to the Hon. Sec.,

WALTER A. PEARCE,

Lyndhurst, Croxted Road, West Dulwich.

PAST PRESIDENTS.

1872 ... J. R. WELLMAN.
1873 ... ,,
1874 ... ,,
1875 ... A. B. FARN.
1876 ... ,,
1877 ... J. P. BARRETT.
1878 ... J. T. WILLIAMS.

1879 ... R. STANDEN, F.E.S.
1880 ... A. FICKLIN.
1881 ... V. R. PERKINS, F.E.S.
1882 ... T. R. BILLUPS, F.E.S.
1883 ... J. R. WELLMAN.
1884 ... W. WEST, L.D.S.
1885 ... R. SOUTH, F.E.S.

REPORT, 1885.

THE Council have pleasure in again reporting a year of satisfactory work and progress, testified by the numerous exhibits, and the increasing interest taken by Members in the Meetings of the Society.

It will be remembered that, owing to the disposal of the premises in which the Society had its offices, we were again compelled to seek a new abode. The change has been one for the better. The new position chosen by your Council we feel sure has done much to improve the standing of the Society, the accommodation and comfort afforded being a vast improvement on our former quarters.

The position of the rooms is all that can be desired, and although the change was inconvenient at the time, we may safely conclude that no one has regretted it.

This year we observe with pleasure the development of a spirit of unreserve in the imparting of personal knowledge, as evidenced by the number of papers, communications, etc., that we have had the pleasure of listening to.

Six new Members have been elected this year, but we regret to say that three others have sent in their resignation; therefore our present membership numbers fifty-five.

We have pleasure in stating that the financial position of the Society is in every way satisfactory.

The Library has been greatly improved by the binding of some fifteen volumes: thus we were enabled to do by the generosity of several anonymous friends. The duties of Librarian are still rendered by Mr. CHANEY, who has attended to them with his usual care.

The additions this year are as follows, viz. :—

DONATIONS.

“The Entomologist” for 1885, and “The Zoologist” for 1885.

From Mr. T. P. NEWMAN.

“The Entomologist’s Monthly Magazine” for 1885. From Mr. M’LACHLAN.

"Transactions of the Entomological Society of London" for 1884. From Mr. W. H. MILES.

"Our Insect Allies;" "Transactions of the Entomological Society of London" for 1885; and "The Garner" (Vol. I.) From Mr. T. R. BILLUPS.

"Stephens' British Entomology" (2 Volumes). From Mr. E. STEP.

"The Sixth Annual Report of the Dulwich College Science Society." From the SOCIETY.

"Illustrated Science Monthly." From Mr. J. T. CARRINGTON.

BY PURCHASE.

"Science Gossip" for 1885.

Cameron's "Phytophagous Hymenoptera," Vol. II.

The Society's Collection of Insects is steadily progressing; and to Mr. WEST, the Curator, we owe the arrangement and preservation of this valuable portion of the Society's work.

Additions this year have been:—

172 species of *Micro-* and *Macro-lepidoptera*, from the President, Mr. SOUTH; and several species of *Lepidoptera*, from Mr. ADKIN.

We should have been glad to have reported a like progress in the Herbarium, but we are sorry to say no new species have been added to it this year.

The Excursions held this year were to

Chingford on May 16th.

Oxshot „ June 6th.

Boxhill „ „ 27th.

Chobham „ July 18th.

Folkestone „ August 3rd.

the most successful being those to Oxshot and Boxhill.

The principal event of the year was the Exhibition, held at our Rooms on December 3rd, which was a great success, and has established on a firmer basis the reputation of the Society. The Exhibition consisted of all branches of Natural History, the Class Insecta being best represented; the other Classes comprising Mammalia, Aves, Arachnida, and Mollusca.

The Botanical exhibits included specimens and coloured studies of British and exotic plants ; also coloured studies of British Fungi.

The lower forms of Animal and Vegetable life were well represented in the room set apart for the display of Microscopical objects, in which the Society was assisted by Messrs. ENOCK and NEWMAN, and Members of the South London and Queckett Microscopical Societies.

Among the Exhibitions at our Meetings we notice the following :—

Hymenoptera.

MR. BILLUPS, *Hymenoptera-Aculeata*, such as *Pompilus spissus*, *Priocnemis pusillus*, *Sphecodes subquadratus*, *S. variegata*, *S. similis*, *S. affinis*, *Prosopis dilata*, *P. confusa* ; also many rare species of *Ichneumonidae*, such as *Chrysis fulgida*, *C. neglecta*, wasps' nests, genera *Polistes* and *Odynerus* from Borneo, and nest of *Vespa germanica* from North Devon.

MR. WEST (Greenwich), Wasp's nest from S. America.

Lepidoptera.

MR. ADKIN (Vice-President), *Eugonia quercinaria* including var. *infusata*, and the Irish form of *Noctua dahlia* ; also the following, all bred. *Endromis versicolor*, *Notodonta chaonia*, *Acronycta alni*, *Eugonia erosaria*, *Eupithecia satyrata*, also *Acidalia inornata*, and a very dark form of *Dianthæcia capsophila* from south of Ireland.

MR. BARKER, varieties of *Lycæna icarus (alexis)* and *Boarmia repandata*, and *B. abietaria*, bred ; also *Acidalia rubiginata (rubricata)*, taken in the Warren at Folkestone, in August.

MR. COOK, *Chærocampa porcellus*, var., *Lithosia griseola*, and bleached variety of *Epiphinele (Satyrus) ianira*.

MR. COOPER, *Pericallia syringaria* (bred), and *Zonosoma (Ephyra) orbicularia*.

MR. CROKER, Variety of *Abraxas grossulariata*, *Geometra (Iodes) vernaria*, and *Melitæa athalia*, from Cromer.

MR. DOBSON, *Eugonia (Ennomos) erosaria*, *Drepana lacertinaria (Platypteryx lacertula)*, dark var., and *Dicranura bifida*.

MR. ELEY, *Drepana lacertinaria (Platypteryx lacertula)*, and *Lobophora lobulata*.

MR. ELISHA, *Lithocolletis bremiella*, *L. canvella*, *L. lantella* (bred), *Eupæcilia udana*, *Acronycta strigosa*, and *Plusia chryson (orichalcea)* (bred); also *Coleophora vibicigerella*, bred from larvæ taken in the Essex salt marshes during the present year.

MR. GASKELL, *Lithosia deplana (helveola)* and *Dianthæcia conspersa*.

MR. HALL, *Dianthæcia albimacula*.

MR. HELPS, *Melanippe unangulata*, and an unusually pale variety of *Eurrhynx urticata (Botys urticalis)*.

MR. HICKLING, a strongly marked specimen of *Argynnis aglaia*, and *Sphinx convolvuli* taken at Sidcup.

MR. LEVETT, a variety of *Vanessa urticæ* and *Angerona prunaria*, also *Dianthæcia conspersa*.

MR. LOWRY, *Gnophria (Lithosia) rubricollis*.

MR. McLACHLAN, *Psychidæ* larva-cases from Zanzibar, resembling the molluscan genus *Cyclostoma*.

MR. MERA, *Chærocampa elpenor*, var., and *Dicranura furcula*.

MR. OLDHAM, *Thecla betulæ* and *Ptilodontis palpina*.

MR. W. A. PEARCE, *Acidalia rusticata* and *Eupithecia minutata* (bred).

MR. SOUTH (President), Varieties of *Polyommatus phlæas*, *Lycæna icarus*, *Zygæna filipendulæ* and *Boarmia repandata*; *Chærocampa celerio* from Natal and Italy, British and Swiss *Melitæa*, *Lycæna escheri* and *L. dorylas* from Switzerland, and living larvæ of *Toxocampa cracæ*, also several local Tortrices.

MR. TUGWELL, varieties of the *Zygænidæ*, the unique British specimen of *Syntomis phegea*, *Eugonia autumnaria*, *Nola centonalis* and the whole of the *Dianthæcia*, northern and southern forms.

MR. J. JENNER WEIR, *Deiopeia pulchella* from South Africa, varieties of *Lycæna icarus (alexis)* and *L. corydon*, also the exotic genera *Morpho* and *Caligo*, and a series of *Danaïs archippus*.

MR. WELLMAN, *Sesia chrysidiformis*, *S. ichneumoniformis*, *S. culiciformis*, taken at Folkestone, *Chærocampa celerio* from Walton-on-Naze, varieties of *Cidaria suffumata*, second brood of *Acidalia trigeminata*, and a third brood and larvæ of *A. rubiginata (rubricata)*, also *Lemiodes pulveralis*.

MR. WEST (Greenwich), *Spilosoma (Arctia) urticæ*.

MR. WEST (Streatham), *Oporina croceago* (bred), *Acronycta myricæ*, *Nudaria senex*, *Acidalia marginepunctata* (*promutata*), var., and *Chesias spartiata* from Folkestone.

MR. J. T. WILLIAMS, *Sphinx convolvuli*, *Plusia chryson* (*orichalcea*) (bred), and *Oxyptilus distans*.

Coleoptera :—

MR. BILLUPS, the rare *Anthicus Schaumi*, *Scolytus pruni* (bred), *Scymnus frontalis* *Stilicus geniculatus*, *Quedius attenuatus*, *Cis vestitus*, *Olibrus particeps*, *Coccinella 12-guttata*, and many exotic species.

MR. CHANEY, *Carabus auratus*, *Donacia menyanthidis*, *D. thalassina*, *D. semicuprea*, *Bembidium varium*, *Lina populi*, *Aphodius lividus*, and *Mononychus pseudacori*.

MR. CROKER, Exotic *Coleoptera*.

MR. ELEY, *Notiophilus rufipes*, *Cerylon fagi*. and a fine specimen of *Brachycerus apterus* from the Cape of Good Hope.

MR. WEST (Greenwich), *Calosoma sycophanta*, *Chlænienus Schrankii*, and *Stenolophus Skrimshiranus*.

Hemiptera :—

MR. BILLUPS exhibited *Salia Cocksii*, *Dicyphus errans* and *Globiceps flavomaculatus*.

Homoptera :—

MR. BILLUPS exhibited *Eupteryx picta*, *Cybus smaragdula*, and *Bythoscopus flavicollis*.

MR. J. JENNER WEIR, species of *Mantidæ* and *Cicadæ* from South Africa.

MR. BILLUPS also exhibited Exotic *Neuroptera*.

MR. McLACHLAN, European *Trichoptera*, *Ascalaphidæ*, *Nemopteridæ* and ant-lions.

MR. W. A. PEARCE, Trap-door spider and nest, and Horned Lizard, Genus *Phrynosoma* from California.

Mollusca :—

MR. BILLUPS, *Zonites excavatus*, *Z. radiatulus*, from Bromley, Kent, *Helix nemoralis*, var. *roseolabiata*, *Achatina acicula* and *Paludina vivipara*.

MR. W. A. PEARCE, *Chiton chilensis* from California.

MR. STEP, *Paludina contecta*, *Pupa marginata*, *Sphærium ovale* from Richmond Park, and *Cochlicopa tridens*.

MR. WEST (Streatham), *Bulimus acutus* including var. *nigricens* from New Quay, Cornwall.

MR. COOK exhibited some excellent mounted specimens of birds, including *Strix flammea*, *Turdus merula*, *Sternus vulgaris*, *Fringilla cælebs*.

Botanical Exhibits :—

MR. A. E. PEARCE, Sketches of Exotic and British plants.

MR. W. A. PEARCE, Exotic and British plants, among the latter being a curious monstrosity of *Digitalis purpurea*.

We have to thank the following Gentlemen who have exhibited at our Meetings, as Visitors, viz. :

Messrs. BIRD, BOWER, BROOKS, CRIPP, DAWES, FARN, GURNEY, JAGER, JANSEN, LEWCOCK, MACKENZIE, NEAVE, ROWE, SHUTTLEWORTH, TUTT, WATKINS and WEBB.

From this lengthy Report, which represents but a portion of the year's exhibits, it will be seen that the Members have been doing serviceable work, and we hope to be able as an outcome of this Report to record next year a greater increase of Members.

WALTER A. PEARCE,

H. W. BARKER,

Hon. Secretaries.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

BALANCE SHEET FOR THE YEAR 1885.

RECEIPTS.			EXPENDITURE.		
	£	s. d.		£	s. d.
To Balance from last Audit, Dec. 18th, 1884	3	12 10½	By Rent	...	...
" Library Fines	...	0 10 2	" Purchase of Books, and Binding	...	6 2 6
" Entrance Fees and Subscriptions	...	21 18 6	" Postage and Stationery	...	2 15 3
" Arrears Received	...	4 16 0	" Printing	...	1 17 7½
			" Expenses of Exhibition	...	5 0 0
			" Sundries	...	3 8 3
			" Balance in hand...	...	1 4 6
				...	10 9 5
	£30	17 6½		£30	17 6½
ASSETS.			LIABILITIES.		
To Cash Balance in hand	...	10 9 5	By Rent, 1 Quarter, to Christmas, 1885	...	2 5 0
" Estimated realisable Proportion of Arrears	1	10 0	" Balance of Assets over Liabilities	...	9 14 5
	£11	19 5		£11	19 5
Balance	...	£9 14 5			

Audited, compared with vouchers, and found correct, *Thursday, December 17th, 1885.*

H. W. BARKER, }
A. W. MERA, } *Auditors.*

EDWARD STEP, *Treasurer.*

PRESIDENT'S ADDRESS.

GENTLEMEN,

It being customary for your President, at the expiration of his term of office, to briefly review the present position and future prospects of the Society, I have very great pleasure in performing this, the final duty devolving upon me.

Our Society, like other Societies of a kindred nature, has been subjected to a somewhat chequered career since its foundation in 1872. It is not, however, my intention to unveil its past history further than will enable us to glance at our position in December, 1884. We were then just beginning to settle down in our quarters in the Borough, and my friend and predecessor in the chair, Mr. West, in his farewell address congratulated us on the possession of a larger and at the same time less expensive room than that we had previously occupied. We little anticipated at that moment the awkward predicament from which we were shortly to be called on to extricate ourselves.

You may remember that in March last (1885) I had to announce to the Society that the landlord, from whom we rented the room in which we were then assembled, was about to close his premises, and he requested us to remove all that belonged to us as soon as we possibly could.

Fortunately for us we had among the Members of our Council, gentlemen who were able to cope with the difficulty which thus unexpectedly turned up. For a time the Society was without a local habitation, but through the kindness of Mr. Billups, the Members of our Council were enabled to meet and transact the extraordinary business connected with our enforced change of residence. It only remains for me to say in this connection, that the Society is fortunate in the change of domicile which has been effected, and that our best thanks are due to Messrs. Adkin, Billups, Ficklin, Pearce and

Step. These gentlemen, by charging themselves with particular duties, contributed materially towards the recovery of the Society from its unpleasant position, and by their energy and tact enabled us to secure our present commodious rooms. We have now the advantage of being within a short distance of the City, and the London Bridge and Metropolitan Railways. Thus favourably situated we may reasonably expect to obtain additional recruits from among those dwellers on the other side of the river, who are interested in Natural History, as well as from those who reside in localities south of the Thames.

It is to be regretted that for some obscure reason or other, one or two of our old Members have withdrawn their support; but as a set off against this, we have had the satisfaction of welcoming the return to our ranks of certain workers who had been estranged from the Society for some years.

As you will have learnt from the Treasurer's report, our financial position is not only sound, but we have a respectable balance in hand.

The attendance of Members and the business transacted by the Society, during the year now drawing to a close, not only maintains the improved character manifested during the latter part of 1884, but on one or two occasions has afforded evidence of still greater improvement. This encourages me to exhort you to exert yourselves to the utmost to prevent the Society from again subsiding into the inert condition which at one time promised to put a period to its existence. Let us endeavour to raise it to such a state of efficiency and usefulness, as will establish it in the front rank of local Natural History Societies.

If it is our desire, as I have every reason to believe it is, that the Society should be considered something more than a Conversational Club, it is of primary importance, that when we meet to transact the business of the Society, we should give our undivided attention to such business, especially during the time that interesting facts are being communicated.

Our Exhibition this year eclipsed anything of the kind hitherto attempted by the Society. Although the greater proportion of the exhibits pertained to the class Insecta,

various other Zoological classes were represented, and the sister Science of Botany was not unrecognized.

In the room set apart for Microscopes, no less than 21 instruments were fitted up. Of this number 11 belonged to Members of the South London Microscopical and Natural History Society. To this Society, as also to the Lambeth Field Club, we are indebted for much valuable assistance, and I take this opportunity of thanking these Societies, on behalf of the South London Entomological and Natural History Society, for their courtesies.

Among the very large number of visitors who favoured us by attending, were many distinguished Entomologists and workers in other branches of Biological Science. Several of these also contributed most interesting exhibits.

Altogether, I think I may fairly congratulate the Society upon having scored a success. Although such success is unquestionably due to the united action of all, still the carrying out of details, must of a necessity, rest with a few. As a fact, the general plan of the Exhibition was worked out by Mr. Adkin, and in the execution of that plan he was very ably seconded by Mr. Billups. To these gentlemen, and to our worthy Secretary, Mr. Pearce, on whom devolved the incidental correspondence, the thanks of the Society are especially due for their careful forethought and untiring zeal, which practically conduced so much to the happy issue of the undertaking.

One of the specified objects of the Society, is the "diffusion of Biological Science, by means of papers and discussions." Up to the present I am afraid we have not done a great deal towards giving effect to this article of our Association. However, it is perhaps not too much to hope that the little we have done in this direction during the past year, is but an earnest of the greater things we propose doing in the future.

Among the many useful labours that should be undertaken by a local Natural History Society, is the compilation of the Flora and Fauna of its own particular district or county. County and district lists of animals or plants, consisting of names and localities only, are not without a certain value to

collectors ; but from a scientific point of view, they are comparatively valueless.

The compiler of a Flora or Fauna, or any section or sections thereof, will do well to bear in mind that the end and aim of his labour should not be simply to enumerate the species occurring in any given area or district. He should endeavour to impart to his work a deeper interest and a greater value, by giving not only the habitat of animal and the station of plant, but also information respecting the geological features—especially as regards subsoils—of the locality, and distributions of the species over the area dealt with. Particular attention should be given to variation, and all species which vary, or show a tendency to vary, even though it be but slightly from the type, should be noticed. For instance, supposing we are compiling a list of the *Lepidoptera* of Surrey, and we know that the Box Hill representatives of a species differ from those occurring in other parts of the county, we should certainly not omit reference to the fact, but should briefly point out the characteristics of the Box Hill form. The habits of local forms of species may also differ from the normal habits of the types of those species, and where such is known to be the case, particulars should be given. Very many other details might be added ; these will suggest themselves to the compiler who undertakes his task, with the set purpose of producing a work which shall be of service to the student as well as the collector.

Some years ago, when the Society was solely Entomological, it was resolved to collect material for the formation of the insect Fauna of our district, which I suppose, would be particular portions of Kent, Surrey, and Sussex. I am given to understand, that certain sections of the list were elaborated to something like completion, and other sections were in a forward state. Estimates for printing were obtained, and all preparation made for early publication, when for some reason the whole thing collapsed. I don't know why, when the proposed Fauna was on the very eve, as it were, of publication, it should have been allowed to become a dead letter. There may have been dissension in our ranks. Surely the private pique of a Member or Members could not derange the

organization of a Society to the extent of preventing that Society from proceeding with an undertaking upon which it had long been engaged, and which it had nearly completed. That the existence of a Society depends upon the unity and cohesion of its Members is a fact I can readily understand, but that a useful work, which all Members of the Society are interested in, and contribute to, can at any moment be suppressed by the action of one or more Members, is a state of things which I must confess myself unable to comprehend.

One would naturally conclude that as material, in the shape of local lists, notes, observations, etc., was furnished to the Society for an avowed purpose, such material would still be found among the property of the Society. This, however, I regret to say, is not the case. I am informed that the MS. list of *Coleoptera* is still at our service, but I am afraid that the same cannot be said of the MS. list of *Lepidoptera*, or yet of the original local lists and notes from which it was compiled.

I venture to say that the Society is, at the present moment, as well qualified to take in hand the preparation of the insect Fauna of Kent, Surrey, or Sussex, or any particular area or areas of those counties, as it has been at any time since its establishment.

As a nucleus we have the MS. list of *Coleoptera*, but lists of all other Orders will have to be compiled *de novo*. I may add that this matter will probably come under the consideration of the Council at an early date. If it is deemed expedient that a Fauna should be compiled, I hope that the proposal will not only meet with your approval, but that every Member will render all the assistance he possibly can towards making the work a credit to the Society.

Occasional reports of our proceedings have been published in the *Entomologist*; and a local paper, *The South London Press*, has frequently inserted extended notices of our meetings. This is very satisfactory as far as it goes; but falls short of what should be the acmé of our ambition. I am sure we should all be pleased to see our proceedings and transactions issued in a separate form, emanating from the Society itself.

It may be within our power to do something in this direction during the New Year, if it is only by enlarging our Annual Report, by adding an abstract of our transactions. As we gather numerical strength, we may hope that our transactions will increase in a proportionate ratio, and that in the near future we may be enabled to publish a volume of respectable size. But for the present we must be content with the modest addition of a few pages to our Annual.

The contemplated improvement is but a small one, I admit ; but if it should be effective, it may be considered as the legitimate outcome of the advancement made by the Society during the year, and for this reason it will be welcome.

Before concluding this portion of my address, I cannot refrain from adverting to a matter which I consider as not only satisfactory in itself, but as indicative of a more comprehensive interest obtaining among those workers who either from choice, or the limited time at their disposal, confine their attention to Entomological subjects only.

Even in the history of the Society, there was a time when anything in the way of an exhibit or communication pertaining to any order other than *Lepidoptera*, received but scant courtesy at the hands of those Entomologists who affected rather the particular than the general. It is gratifying to observe a more liberal feeling springing up among and around us. The Lepidopterist is beginning to recognise the fact, that, as regards insects alone, nature has not exhausted all her wondrous cunning in the creation of Butterflies and Moths, but that a considerable share of it has been reserved for beetles, flies, and such like "beasties."¹

This augurs well for the success of the Society at the time—which I hope is not far distant—when we may have in our body a larger proportion of workers in other branches of Natural History than we have to-day.

In the intercourse of students in various fields of Biological Science, banded together for a common purpose, I see much that cannot fail to contribute to the mutual advantage of all.

¹ According to Kirby, about 12,000 insects of all Orders are known to occur in our islands, and of this number, as you will probably know, only about 2080 belong to the Order *Lepidoptera*.

A number of species have been made known and added to the British Fauna during the year. Of these I note the following :—

Dicranoneura similis, and *Typhlocyba salicola*, two Hemipterons new to Science, named and described by MR. JAMES EDWARDS. (*Ent. Mo. Mag.*, xxi. 229, 230.)

MR. R. H. MEADE describes a new maritime fly (*Ent. Mo. Mag.*, xxii. 152), under the name of *Ceratinostoma maritimum*. This Dipteran possesses some of the characteristics of species in the genus *Scatophaga*, and some of those pertaining to the genus *Cordylura*; it was therefore found necessary to create a new genus for its reception.

A *Lepidopteron*, new to Science, taken by MR. GEORGE COVERDALE in the salt marshes near Shoeburyness, July, 1884, was named and described by MR. STANTON in the *Ent. Mo. Mag.*, xxii. 9, under the name of *Coleophora paludicola*. *Lithocolletis anderidæ*, also new to Science, bred in the spring from larva, found in the preceding October. Named and described. (*Ent. Mo. Mag.*, xxii. 40.)

Two species of *Lepidoptera* are recorded as probably new to the British Fauna by MR. A. F. GRIFFITH, *Ent. Mo. Mag.*, xxii. 64. These are named respectively *Ornix fagivora* and *Nepticula nylandriella*. The first bred in the spring from larva, found in autumn on beech, and the last was found in some numbers on the trunks of mountain-ash in Sutherlandshire, May.

A *Gelechia* taken by MR. SANG, amongst *Artemisia maritima*, in salt marshes, near Redcar in July, is described by MR. STANTON, under the name of *Gelechia tetragonella*. (*Ent. Mo. Mag.*, xxii. 99.)

Nepticula assimilella, a species new to Britain, was bred by MR. W. H. B. FLETCHER, in June last, from larvæ found in Sept. 1884, on *Populus tremula*, in Abbots Wood. (*Ent. Mo. Mag.*, xxii. 113.)

Coleophora potentillæ, recorded by MR. GEORGE ELISHA, as occurring in Epping Forest, cases on *Potentilla tormentilla*, in September, *Ent. Mo. Mag.*, xxi. 254.

Coleophora tinctoriella, named and described by MR. GEORGE COVERDALE, *Entom.* xviii. 225.

Lycæna argiades, a new "blue" recorded by the REV. O. PICKARD CAMBRIDGE (*Entom.* xviii. 249), and *Cucullia artemisiæ*, added to the British Fauna (*Entom.* xviii. 290).

Nine species of *Sphæcodes*, added to the British *Hymenoptera*, and described by MR. EDWARD SAUNDERS, (*Ent. Mo. Mag.*, xxi. 177), viz. :—*spinulosus*, *puncticeps*, *longulus*, *niger*, *pilifrons*, *similis*, *ferruginatus*, *hyalinatus*, *variegatus*, *divisus*, and *dimidiatus*.

At the April Meeting of the Entomological Society of London, MR. BILLUPS exhibited two species of *Pezomachus*, new to Britain, *P. immaturus*, and *P. vulnerans*.

A single example of a *Coleopteron* (*Tachys parvulus*), new to Britain, taken by MR. J. H. SMEDLEY, at Wallasey, September, 1884, and described by the REV. W. W. FOWLER, *Ent. Mo. Mag.*, xxii. 43-

Of these additions to our Fauna, the most important, or at least the most interesting, is that of a new butterfly. The fact of a new butterfly, and that too a species of *Lycæna*, occurring in England, is an event for which Entomologists were hardly prepared. Among *Lepidoptera*, the butterflies have always received most of the collectors' attention. The "blues" especially have been industriously worked. In the hope of obtaining varieties, many Lepidopterists give considerable time to the capture and examination of the commoner species of *Lycæna*. Now that examples of a new species are among the possible results of a free overhauling of such species as *L. icarus* and *L. ægon*, it is probable that both these insects will in the future, like our canine friends at present, have their liberty considerably interfered with. It is to be hoped that the "suspects" may be treated with moderation, and receive their immediate discharge if after capture and examination they are found to have no criminating evidence in the shape of a tail about them, and do not happen to be wanted on a charge of hermaphroditism or aberration.

The circumstances attending the capture of this new species would seem to suggest a more careful scrutiny of our commoner species of *Lepidoptera* in out-of-the-way places. It cannot, however, be expected that the greatest energy or most consummate care will result in the detection of many other new species in this way; but it would be well for us, perhaps, never to take for granted that any object *is* what it appears to be, until we have assured ourselves of its identity. Certain species may be so familiar to us that we would venture to identify them even at a distance; but it is better not to place too much reliance on our ability in this respect. A little trouble taken in the examination of a supposed common object might be rewarded by the discovery of a novelty.

The curious feature connected with the capture of *Cucullia artemisiæ* in this country is the unusual date. Mr. Brooks says he took his two specimens on the 26th of August. On the Continent, where this insect is abundant in its particular localities, it is out in May and June, and the larvæ would be feeding on wormwood at the time Mr. Brooks took his specimens. According to Dr. Staudinger *Cucullia artemisiæ* and *C. absinthii* are both found in Germany, Switzerland, Hungary, Central and South Russia, and in the Altai. *C. absinthii*, however, has a more western range than *C. artemisiæ*, as it occurs in France, also in England. The British counties from which it has been recorded are, Dorsetshire, Devonshire, Cornwall, Somersetshire, Glamorgan, and Berkshire. With the exception of the last-named county all these are on the coast. The first four adjoin, and Glamorgan is only separated by the Bristol Channel.

Wormwood (*Artemisia absinthium*), the food plant of both these insects, has a very wide geographical range. It is found in Europe, N. Africa, Siberia, Dahuria, N.W. India, and N. America. As a British plant it is local, occurring in waste places. It extends from Forfar southwards. In the north and west of Scotland it is rare. It occurs in Ireland, but is probably not indigenous to that country.

The occurrence this year of some of the rarer Sphinges in England has caused no little excitement among lepidopterists. I have not the slightest doubt myself as to their origin. Like the *Colias* they are immigrants in the first instance. Under favourable circumstances they may breed here, but their permanent establishment in England is hardly probable.

In his article on *Anosia plexippus* (formerly known as *Danaïs archippus*) Mr. Jenner Weir states (*Entom.* xviii. 306) that altogether nine specimens of this insect have been recorded as captured or seen in England this year. He also adds that as regards the four specimens taken, and two others seen in Cornwall (*Entom.* xvii. 290-292), "there is no reason to doubt but that they were actually bred in this country." Mr. Weir is further of opinion that there is a fair chance of this handsome species establishing itself in England. Such an event is one that would be most gratifying to all British

lepidopterists, and might be considered as an exchange for *Pieris rapæ*, which North America probably received from us as an importation during late years. This latter insect, by the way, has already developed a climatic race in the New World.

Callimorpha hera has been again taken in the south of England by Mr. Jager, who captured a specimen and saw another on the 24th of August this year. This specimen was brought up to our Exhibition by Mr. Jager. It has yellow hind wings, and is the *var. lutescens* of Staudinger. Mr. Brooks, who it may be remembered has been very successful with this species during three successive seasons, and is also the fortunate possessor of *Cucullia artemisiæ*, was good enough to point out the lucky hedgerow to Mr. Jager.

One specimen of *Callimorpha hera* is recorded by Mr. H. D'Orville, as taken near Exeter on August 14th, 1871 (*Ent. Mo. Mag.* viii. 87). Appended to this note is an editorial, stating that several other well-authenticated cases of the occurrence of *C. hera* in the south-west of England had occurred during the previous ten years, and asking Entomologists who had knowledge of such captures to give an account of the circumstances. I do not find that this request elicited any information on the subject, but I believe there are records extant of a specimen taken at Newhaven in 1855, and another near Brighton in 1868; and at some time before the earliest of these dates, Captain Russell captured several in Wales.

In the *Entomologist* for December last (vol. xviii. 318), Mr. Joseph Potter records the capture of a specimen of *Catocala fraxini* in Hyde Park, on the 9th of September. He states that it was at rest in a sycamore, thirty feet from the ground, and that it had been seen two hours previously on an ash tree. Mr. Potter adds, "I have no doubt it emerged from the pupa in the immediate locality; it had apparently not flown far." Just fifteen years ago, that is in 1870, Mr. Potter recorded a specimen as taken by a friend of his, at rest on an ash tree in Regent's Park, also on the 9th of September (*Ent. Mo. Mag.* vii. 111).

In 1874, Mr. Charles Oldham took a worn specimen at Folkestone, on September 5th, and Parry of Canterbury says he took one "almost equal to bred" in Pine Wood, Kent,

September 26th (*Entom.* vii. 228, 289). A rather wasted example was taken by Mr. W. W. Shaw in Berwickshire, September 9th, 1876 (*Entom.* ix. 278).

In 1880, five specimens were seen or taken at sugar in various parts of the country as follows :—Mr. John Mundie, of Aberdeen, says one visited a sugared tree on August 30th, and two following nights. Mr. Wratishaw took one at Rugby, August 31st. A much worn and broken example fell to the lot of Mr. Griffiths, taken in the Leigh Woods, Bristol, Sept. 1st. Mr. W. White one, at Barnsley, Sept. 6th, and Mr. J. H. A. Jenner, one in fair condition, near Lewes, Sept. 27th (*Entom.* xiii. 240, 241, 281, 310).

Having reviewed the Society's actual position, touched on some of the probable items of our programme for 1886, and also glanced at the most notable captures and important discoveries made this year by Entomologists in Britain, I will now briefly refer to some eminent Biologists, learned specialists, and earnest workers who have been removed from their labours by the hand of death during the past twelve months.

By the untimely death of Mr. RYE, F.Z.S., F.E.S., the scientific world has lost an able Entomologist and most assiduous literary worker, and this Society one of its original patrons.

EDWARD CALDWELL RYE was born in London in June, 1832, and died at Stockwell on Feb. 7th, 1885, after a very short illness, in the fifty-third year of his age.

As an Entomologist, he at first was interested in *Lepidoptera*, but subsequently turned his attention to *Coleoptera*, among which order he was especially successful in discovering species new to the British fauna. In the *Entomologist's Annual* 1863, he commenced a series of articles on British *Coleoptera*, which he continued until the *Annual* ceased in 1874. Mr. Rye was one of the original founders and co-editors of the *Entomologist's Monthly Magazine*, the first number of which appeared in June, 1864. In 1866, he published his well-known *British Beetles*. He was sole editor of the last ten volumes of the *Zoological Record*, and in several of the earlier volumes the article 'Coleoptera' was from his pen. He contributed articles on various orders of

the class *Insecta* to the *Encyclopædia Britannica*, and was also connected with the *Field* newspaper as one of the Natural History editors, and sole editor for *Travel*. In 1874, Mr. Rye was appointed Librarian of the Royal Geographical Society, and from this date his numerous literary engagements caused him to withdraw his attention from entomological field work. His splendid collection of coleoptera is in the possession of Dr. Mason, of Burton-on-Trent, by whom it was purchased a few years ago.

Dr. GWYN JEFFRYS was born in January, 1809, and died January 24th, 1885, aged 76. He practised as a solicitor at Swansea until 1856, when he was called to the bar. Shortly afterwards he retired from the profession, and devoted himself to the study of Natural History, a taste for which he had acquired as a boy when he took great interest in the insects and shells occurring in South Wales. He appears to have made Conchology his principal study, and as an authority soon rose to fame. Among his most important literary works is *British Conchology* in five volumes. He was an honorary LL.D. of St. Andrews, and a Fellow of the Linnean and Royal Societies.

HENRY MILNE-EDWARDS was born of English parents at Bruges, in October 1800, and died in Paris, July 29th, 1885. His name will always occupy a prominent place among the most eminent naturalists of the first half of the present century. Although he at first took up the practice of medicine as a profession, he eventually abandoned this in favour of Natural History, in the study of which he had always evinced a passionate interest. The lower forms of animal life principally engaged his attention, particularly the Marine Invertebrata, and it is among these that he found material for much original research.

His earliest important investigations were undertaken during the year 1826 and 1828, when he and Audouin studied the littoral zone fauna of the coasts of Granville and around the Isles of Chansey to Cape Frehel. In 1829, the results of their labours were brought before the French Academy of Sciences, and in 1830, Cuvier, assisted by Dumeril and Latrielle, drew up and presented to the Academy a report

upon these investigations. In this report, the young naturalists were complimented for the good work they had so successfully conducted.

Among other appointments held by MILNE-EDWARDS was that of Professor of Entomology at the Museum Jardin des Plantes. Besides numerous original memoirs, he was author of many important works; of these it may suffice to mention *Histoire Naturelle des Crustacées* 1834-40, *Histoire Naturelle Coralliaries*, 1857-60, *Leçons sur la Physiologie et l'Anatomie comparée de l'Homme et des Animaux*, 1857-1881, 14 vols. *Recherches Anatomiques et Zoologiques faites pendant un Voyage sur les Côtes de la Sicile*, etc., with nearly 100 coloured plates.

Dr. WILLIAM BENJAMIN CARPENTER, C.B., F.R.S., was born in Exeter, 1813, and died in London, Nov. 10th, 1885, in the 73rd year of his age. He graduated M.D. at the University of Edinburgh at the age of 26, and shortly afterwards commenced the practice of medicine at Bristol. In 1843, he removed to London, with the determination of devoting himself entirely to scientific and literary pursuits. He filled the offices of Examiner of Physiology and Comparative Anatomy in the University of London and Professor of Medical Jurisprudence in University College, until 1856, when he succeeded to the Registrarship of the University of London.

Dr. Carpenter was the author of numerous works; but the manuals of Physiology, human, comparative, and general, are perhaps more particularly associated with his name. His *Microscope and its Revelations* still holds its place, as also does his masterly *Introduction to the Foraminifera*. He also contributed able papers to the *Cyclopedia of Anatomy and Physiology*, and to the journals and transactions of several learned Societies. He took a prominent part in promoting deep-sea exploration and research, and in conjunction with Sir Wyville Thompson, he initiated the Challenger expeditions. The results of these expeditions he reported in the Proceedings of the Royal Society, and in the Journal of the Royal Geographical Society.

Dr. Carpenter was in no sense of the term a specialist, but a many-sided naturalist. After labouring in the brain-exciting occupation of original research, he would by way

of relaxation and amusement contribute to an *Encyclopædia* or compile a text-book. It has been well said of him that in the days when he was fully employed, he was doing two men's work as a profession, and compassing that of a third simply for recreation.

Major F. J. SIDNEY PARRY, F.L.S. Born October, 1810. Died February 1st, 1885, aged 74.

Major Parry was a Coleopterist. His collection of *Lucanidæ*, comprising species from all parts of the world, was almost complete. He was elected a member of the Entomological Society of London in 1840, and was one of its oldest Members.

NICHOLAS COOKE was born at Liverpool, January 1818, and died May 19th, 1885. The loss of this energetic lepidopterist will be greatly felt by the Lancashire and Cheshire Entomologists, whose Society he, in conjunction with Mr. Capper and other friends, founded, and of which he was one of the vice-presidents. His collection of British *Lepidoptera*, probably one of the largest in England, was bequeathed, together with his almost complete one of European Butterflies, to the Corporation of Liverpool.

Mr. Cooke not only industriously worked his own district, but for many years past he collected annually in the Highlands of Scotland. He added *Nyssia zonaria* and some other species to the British Fauna, and was especially successful in the capture of rare and local species, such as *Sesia scoliiformis* and *Crymades exulis*.

JOSEPH SIDEBOTHAM, F.L.S., born near Hyde. Died at Bowdon, Cheshire; May 30th, 1885, aged 62.

Mr. Sidebotham was a thorough naturalist and a student in many other branches of science. He was perhaps more generally known as a Botanist and Entomologist. The Cheshire scientific Societies have lost in him one of their most ardent supporters.

SIDNEY SMITH of Walmer died on the 28th of December, 1884, in the 78th year of his age.

Mr. Smith was probably known to those of our entomological members who have worked much around and about St. Margaret's Bay. His collection of British *Lepidoptera* contained many interesting varieties of certain species, among

which were several of *Callimorpha dominula*, some of which were black, and others had pink or yellow hind wings.

And now, gentlemen, in conclusion I have to tender you my most sincere thanks for the distinction you conferred upon me last December, when you elected me as your President for the year 1885. Believe me that I am deeply grateful for your uniform kindness and courtesy during the time I have had the honour of presiding at your meetings. As previously adverted to, the Society has made progress during the past twelve months, and I shall always feel a pardonable pride in remembering that it was my good fortune to occupy the Presidential chair in 1885.

The present satisfactory status of the Society is due not to any one particular cause, but to the harmonious working of a set of circumstances. Certain officers and members of Council, to whom reference has been made, have by their special efforts on behalf of the Society contributed in no small degree to the general success; but it is my pleasing duty to acknowledge the very able manner in which our Treasurer and Secretary have discharged their several important duties. It is upon these officers that the success of the Society depends to a very considerable extent, and upon whom the bulk of the work connected with the executive devolves. The Assistant Secretary, Mr. Barker, has also rendered valuable service to the Society in drawing up the various reports which have been published. Our Librarian and Curator have bestowed much careful labour on our Library and Collections respectively.

I congratulate the Society on its election of Mr. Jenner Weir as Vice-President.

In Mr. Robert Adkin, whom you have elected as your President for the year 1886, you have a gentleman who is not only in every way well qualified for the position, but is one who has given abundant proof of the keen interest he takes in the welfare of the Society. I have very great pleasure in vacating the chair in favour of Mr. Adkin, and I look forward with the greatest confidence to the future of the South London Entomological and Natural History Society.

RICHARD SOUTH.

ABSTRACT OF PROCEEDINGS.

JANUARY 1st, 1885.

R. SOUTH, Esq., *President*, in the Chair.

Mr. T. R. Billups exhibited specimens of *Hebrus ruficeps*, Linn., taken for the first time in England in the developed form. Locality: Loughton, Essex.

FEBRUARY 5th, 1885.

R. SOUTH, Esq., *President*, in the Chair.

The President read a paper entitled "Some Observations on the Protective Coloration of Lepidoptera." Printed in full at page 36.

Mr. T. R. Billups exhibited two female specimens of *Ranatra linearis*, Linn., taken at Loughton on 6th January, 1885. This Hemipteron, usually associated with stagnant pools, was taken at least a mile from any water.

MARCH 5th, 1885.

R. SOUTH, Esq., *President*, in the Chair.

Mr. H. T. Dobson read a paper, the subject being: "Do the Lower Forms of Animal Life feel Pain?" The author commenced by expounding what was meant by the lower forms of animal life, briefly referred to the division of the animal kingdom by Cuvier, and at some length described experiments which he and others had made; all tending, in his opinion, to show that the lower animals did not feel pain. The paper was illustrated by diagrams of the anatomy of the invertebrata.

APRIL 16th, 1885.

R. ADKIN, Esq., *Vice-President*, in the Chair.

Mr. T. R. Billups exhibited *Pezomachus immaturus*, Först., and *P. vulnereus*, Först., both species being new to

Britain, and having been taken on January 3rd, 1885, in Headley Lane.

MAY 7th, 1885.

R. SOUTH, Esq., *President*, in the Chair.

Mr. T. R. Billups exhibited living specimens of *Carabus auratus*, taken on April 30th, in the Borough Market, from a basket of vegetables imported from the South of France.

AUGUST 6th, 1885.

R. ADKIN, Esq., F.E.S., *Vice-President*, in the Chair.

Mr. T. R. Billups exhibited a rare species of *Proctotrupidæ*, *Inostemma Boscii* Jur, taken on a sunflower leaf at Peckham; also the egg case of a mantis, found in tobacco leaves by Mr. Adkin.

SEPTEMBER 3rd, 1885.

R. SOUTH, Esq., F.E.S., *President*, in the Chair.

Mr. Jenner Weir exhibited species of *Arachnida*, of the order *Solpugidæ*, which appeared to belong to the genus *Galeodes*. Mr. Weir said these specimens were taken in the Kalahari Desert by Mr. G. A. Farini, and he briefly referred to the structure and size of these Arthropods, they being about two and a half inches in length, and the legs extending over six inches.

Mr. T. R. Billups exhibited *Ledra aurita*, L., *Centrotus cornutus*, Linn., *Gargara genistæ*, Fab., *Ulopa reticulata*, Fab. etc., and read the following notes:—

“The insects exhibited belong to the sub-order Hemiptera-Homoptera. They include a very extensive set of insects, in which the upper and lower wings are generally homogeneous, I mean by that of the same kind or nature. The antennæ are in most of them very short and bristly, and consisting of three joints, the head having only two ocelli. They are represented in this country by some fifty-two genera and two hundred and seventy species. If strange variety of form, in fact, if the most *outré* and *bizarre* shapes be the object of admiration,

this family will supply abundant material; and if our own especial group in the Fauna list should not be enough, we have only to go to Guiana, the Brazils, and the islands of Florida, where these strange little creatures may be met with in the most beautiful, at the same time weird and fantastic shapes; while, to come nearer home, Geoffroy, the historian of the insects of the environs of Paris, while describing *Centrotus cornutus*, calls it "Le Petit Diable," or "Little Devil," and at the present time this group is known all over the Continent as "Geoffroy's Little Devils." The Cercopidæ proper and the Tettigoniæ are very extensive and beautifully coloured long, or rather parallel insects. They are represented in this country by two genera and two species only: *Tricophora sanguinolenta* and *Tettigonia viridis*, but they abound in South America and in Asia.

Our smaller species such as *Typhlocyba*, *Alebra*, *Cybus*, *Eupteryx*, *Gnathodus*, etc., are extremely beautiful little creatures, while to come further on, which of us is not acquainted with our active little saltatorial friend, *Aphrophora Spumaria*, the common Frog-hopper of our little town gardens. How many of us and how often have we been annoyed by seeing our plants infested by a larva, which carries on his depredations and robs our plants of its juices while artfully concealed and enveloped in a mass of white froth, closely resembling saliva. De Geer, the celebrated Swedish naturalist, wishing to know how the larvæ produced this frothy dwelling, says he took one of them out of its home, wiped it dry with a camel's hair brush, and placed it on a young stalk of honeysuckle, placed in a glass of water to keep it fresh. It began, he says, by fixing itself on a part of the stalk, into which it inserted its trunk, and remained a long time in this attitude, occupied in sucking and filling itself with the sap. Having then withdrawn its trunk, it remains there, or else places itself on a leaf, where, after different reiterated movements of its abdomen, which it raises or lowers and turns on all sides, one may see coming out of the hinder part of its body a little ball of liquid, which it causes to slip along, bending it under its body. Repeating again the same movement it is not long in producing a second globule filled with air like the first, which

it places side by side with, and close to, the preceding one. This operation it continues as long as there remains any sap in the body, it is very soon covered with a number of small globules; which, coming out of its body one after the other, tend towards the front part, aided in this by the movement of the abdomen. It is all these globules collected together which form a white and extremely fine froth, whose viscosity keeps the air shut up in the globules, and prevents its moisture from easily evaporating. If the sap which the larva has drawn from the plant, is exhausted before it feels itself sufficiently covered with froth, it begins afresh to suck, until it has got a new and sufficient quantity of froth, which it takes care to add to its first stock. My own observation leads me to believe that this frothy exudation is secreted by peculiar organs in the tail of the larvæ. This exudation undoubtedly serves to protect them from the heat of the sun; the soft body of the larvæ but for this would soon shrivel up; it also conceals them from birds, and other insects which would otherwise prey upon them. Notwithstanding the concealment, wasps, however, often get them out and carry them off. It is in the froth that the larvæ change into pupæ, and do not leave their strange habitation to undergo their final metamorphosis. It is in this vaulted cell that the pupa disengages itself, little by little, from its skin, and in the month of September we find these creatures most abundant. Towards the end of autumn the females become gravid: they are then so heavy that they are scarcely able to fly or jump; while the males, on the contrary, make prodigious bounds, springing sometimes two or three yards. How few know that the little broad-headed, brownish, frog-jumping insect now so common on plants is the frog-spittle insect in its perfect state. Many good people class these insects along with the Aphides, as species of the very comprehensive, though most unscientific genus, vulgarly called Blight."

Mr. H. Janson, who was present as a visitor, exhibited a specimen of *Sphinx convolvuli*, taken on the knocker of a door in Victoria Road, Finsbury Park.

SEPTEMBER 17th, 1885.

R. SOUTH, Esq., F.E.S., *President*, in the Chair.

Mr. Adkin exhibited a female variety of *Pararge megæra*, taken at Folkestone, in which the black spot near the apex of the right fore wing is represented only by a dark dot, not larger than the usual white centre, which in this case is wanting.

Mr. Elisha exhibited *Geometra smaragdaria*, bred from larvæ taken in the Essex salt marshes.

Mr. T. R. Billups exhibited a species of *Lepisma*, new to science, which was found swarming on some account books which were kept in an iron safe at Messrs. Adkins' Tobacco Factory, Aldgate. Mr. Billups said its nearest approach was *Lepisma subvittata*, Guérin, which was described by Sir John Lubbock in his *Monograph of the Collembolla and Thysanura*, and which was exceedingly common round the environs of Paris.

OCTOBER 1st, 1885.

R. SOUTH, Esq., F.E.S., *President*, in the Chair.

Mr. J. Jenner Weir exhibited specimens of *Lycæna argiades*, taken in Saxony, also *L. trochilus*, which he said was the smallest known European butterfly.

Mr. Cook exhibited a specimen of *Sphinx convolvuli*, taken in an oil shop at Rotherhithe.

Mr. Step exhibited colour sketches of *Boletus scaber*, *Agaricus* (*Amanita*) *vaginatus*, and *Agaricus* (*Clitopilus*) *orcella*; three species of edible fungi, found a few days previously on Bookham Common, Surrey. Mr. Step stated that he had found these in some abundance, growing in close proximity to *Agaricus rubescens*, *A. procerus*, *Boletus edulis*, and other species. Questioned as to their edible qualities, he replied that he could not endorse the encomiums of Badham respecting the *Boleti*, but all the other species named he had found excellent. Mr. J. Jenner Weir remarked that on the Continent he had frequently seen various *Boleti* for sale in the markets, and quantities of *Cantharellus*, which, according to Mr. Step, had been abundant this season on Wimbledon Common.

OCTOBER 15th, 1885.

R. SOUTH, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited specimens of *Tettigometra impressopunctatus*, Dufour, and communicated the following note:—

“It was first taken in 1865 at Freshwater Bay, Pembroke-shire, by the Rev. T. A. Marshall, in a sheltered hollow, thinly covered with thyme and short grass. It was there very common, but restricted to a small area. It is a sluggish insect, concealing itself on the ground, where it is not easily detected. According to Signoret it occurs near Paris, and on both sides of the Mediterranean. The present specimens were taken in a little hollow, in some numbers, on the range of hills known as the Hog’s Back, running from Guildford into Portsmouth, by Dr. Capron, of Shere, near Guildford, who has generously presented them to me.”

Mr. Adkin exhibited a bred series of *Cidaria prunata*, Linn., and remarked that the larvæ should be fed on red, not black, currant, and suggested as a probable cause of the failure of some who had attempted to rear this species during the present summer, that the latter food-plant had been used. In his experience it was easy to rear. The specimens now shown were the descendants of a moth received from Folkestone in August of last year. The ova commenced to hatch on May 5th, the larvæ fed readily on the young leaves of the red currant, on which they were placed, the first spinning up on June 24th, the imagines emerging between July 10th and 26th. The larvæ required but little attention during the time that they were feeding, and in spinning up appeared to select a part of the stem of the food-plant just below the juncture of the branches, several cocoons being placed together, the cluster thus formed often completely encircling the main stem.

NOVEMBER 5th, 1885.

R. SOUTH, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited two species of Coleoptera, viz., *Mononychus pseudacori*, F., and *Lina longicollis*, Suf.,

also four species of the *Tenthredinidæ*, viz., *Hoplocampa plagiata*, Klug., *Blennocampa melanocephalus*, Fab., *Lyda flaviventris*, Cam., and *Fanus femoratus*, Klug., and made the following remarks :—

1. *Mononychus pseudacori*, F., feeds on *Iris Pseudácorus* the yellow iris, flag, or corn flag.

2. *Lina longicollis*, Luf., is not at all a common beetle, but occurring locally, and sometimes in profusion on alder or poplar.

3. *Hoplocampa plagiata*, Klug., is an exceedingly rare sawfly, there being only three known captures recorded ; one by the Rev. T. A. Marshall, at Boxhill, in 1870 ; one by myself, a female, at Weybridge, May, 1884 ; and the present specimen, also by myself, at Chingford, May, 1885.

4. *Blennocampa melanocephalus*, Fab., appears to be generally distributed in England and Scotland, but not common ; this specimen being taken at Chingford, May, 1885.

5. *Lyda flaviventris*, Cam., very rare, this being according to Cameron, the finest specimen captured in this country, there being only three recorded captures previously. This specimen was taken at Boxhill, May, 1884, by myself.

6. *Fanus femoratus*. This is also an uncommon sawfly, and was bred from the almost extreme ends of the sallow, into which the larvæ bore, and feed on the pith undergoing their final metamorphosis in the stem. This insect has also been known to attack a young oak, burrowing under the bark, and causing small gall-like excrescences, in which, unlike most of the *Tenthredinidæ*, it changes, instead of dropping into the ground to pupate.

Mr. T. W. Hall exhibited a remarkable variety of *Abraxas grossulariata*, and said it was the only variety bred from 343 larvæ, 190 of which were infested either with the Ichneumon *Cassinaria vidua*, Gr., which was considered rare, or the Dipteron *Hyctodissa lucorum*, Fall. ; specimens of both species, mounted by Mr. Billups, were also exhibited.

Mr. R. South exhibited *Melitæa athalia*, *M. aurelia*, *M. parthenie*, and *M. dictynna*, and read the following note:—

“In 1881 I found a good number of *Melitæa* larvæ feeding on yellow cow-wheat (*Melampyrum pratense*) and foxglove (*Digitalis purpurea*). From these I bred a fine and variable series of *M. athalia*.

Through the kindness of the Rev. J. C. W. Tasker, I have a fairly good collection of Swiss butterflies, and among them are fine series of several species of *Melitæa*.

Among the North Devon *athalia* I find an example which comes so close to *M. aurelia* from Switzerland, that I am quite unable to detect the least difference between them. Entomologists more experienced in separating closely allied species of *Rhopalocera*, may not have the same difficulty. Other specimens in the North Devon series show a tendency towards the *aurelia* type on the upper surfaces of their wings, and the undersides of others very closely resemble the coloration and markings of *M. parthenie*.

As regards the geographical distribution of these three insects, it may be stated that *athalia* has a much wider range than either of the others. It is distributed throughout the countries of Europe, even to the Arctic regions, and is also found in Asia Minor, in the mountainous parts of Armenia, and in Siberia; still it only occurs in certain localities in those countries. As a British insect, for instance, it is only to be found in certain places in South England and South Ireland. There is no record of its having been observed in the North of England or in Scotland, though why it should be absent therefrom, seeing that it is an inhabitant of regions very much farther north, is a question which does not appear easy to answer in a satisfactory manner.

Aurelia and *parthenie* both occur in Switzerland, but from this country their course of distribution diverges. The first named, that is, *aurelia*, is found as far north as Lapland, and east into Asia as far as Armenia. *Parthenie*, on the other hand, is confined to mountainous districts in South-West Germany, France, Piedmont in Italy, Central Spain, and Andalusia. Thus one spreads north and east, and the other south and west.

Both these insects are also local, being restricted, like *athalia*, and indeed all other species of the genus, to small holdings here and there throughout the area of their distribution.

In the case which I exhibit this evening you will find series of *Melitæa athalia* from Sussex, Essex, North Devon, and Switzerland. In the last row but one is a specimen of *Melitæa dictynna* from Switzerland, and below it one of the North Devon examples of *athalia*, which is not altogether unlike the Swiss insect.

In the last row are three specimens of *M. parthenie* from Switzerland. These are put in so that you may compare them with the Swiss *M. athalia*. I think you will agree with me that the Swiss *athalia* favours *parthenie* rather than the British *athalia*, as regards colour and pattern of the upper wing surfaces. As already adverted to, some of the North Devon *athalia* resemble *parthenie* on the under sides.

Next to *parthenie* you will observe two examples of *M. aurelia* (Swiss), and below them two North Devon *athalia*. I think that you will admit that the foreigner and the Britisher are exceedingly alike.

When I first observed the resemblance of these specimens to *M. aurelia*, I was inclined to send a note to our Entomological journals regarding the capture of this species in Britain. Further comparison of British with Swiss *M. athalia*, and these again with Swiss *M. aurelia* and *M. parthenie* induced me to suspect that these last-named insects might not be distinct species, but only forms of *M. athalia*.

However, I have at the present moment no strong evidence to offer in support of my supposition. I must therefore let it remain in abeyance until I have collected more facts and additional material, when I may be enabled to put the whole matter before you in a more complete form."

Mr. Step read a short paper on the Freshwater Mussels (*Anodonta cygnea* and *anatina*), which he illustrated by specimens and diagrams. The species were said to be widely distributed over the lakes and rivers of the country. Commencing with a description of the shell, its hinge and the muscles by which the valves are held together, the reader

proceeded to the morphology of the creature, and thereafter to an explanation of its anatomy and physiology, concluding with an account of its reproduction and development.

NOVEMBER 19th, 1885.

R. SOUTH, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited the following *Ichneumonidæ*:

<i>Bracon osculator</i> , Ns.	Bred from <i>Coleophora virgaureæ</i> .
<i>Hemiteles fulvipes</i> , Gr.	„ <i>Zygæna filipendulæ</i> .
<i>Colastes braconius</i> , Hal.	„ <i>A miner</i> in oak-leaves.
<i>Bracon variator</i> , Nees.	„ <i>Coccyx strobilana</i> .
<i>Macrocentrus infirmus</i> , Ns.	„ <i>Hydræcia petasites</i> .
<i>Ichneumon computatorius</i> , Gr.	„ <i>Arctia fuliginosa</i> .
<i>Lissonota segmentator</i> , Fab.	„ <i>Sesia sphegiformis</i> .



SOME OBSERVATIONS ON PROTECTIVE COLORATION OF LEPIDOPTERA.

READ FEBRUARY 5TH, 1885, BY RICHARD SOUTH.



ALL forms of animal life dependent upon plants are themselves the natural prey of other animals. It is, therefore, a matter of vital importance to the majority of animals that they should possess colour and markings, which in character, assimilate or harmonise with their surroundings. The plant-feeder requires protective colour, so that it may conceal itself from its carnivorous enemies, and the flesh-eating animal, so that it may be able to steal upon its herbivorous prey unobserved.

In those localities, as for instance in the tropics, where vegetation is most varied, a corresponding variety in animal life will be found to exist; but on the other hand, in the sandy deserts where there are neither trees nor shrubs we find the coloration of reptile, bird, or beast, to be in unison with that of the sandy soil. Again, in the Arctic regions, pure white, with one or two exceptions, is the prevailing tint of fur and feather.

Some writers, although they do not entirely deny its being to a certain extent protective, contend that protection is not the primary object of colour. Such writers draw attention to the heat absorbing qualities of colour, and argue that, in the Arctic regions for example, white fur is of more utility to animals than would be a darker coloured fur, because white is a bad absorber of heat, and in consequence an animal possessing a white fur would be better able to exist in its ice-bound habitat, as the heat of its body would be economised and not readily parted with. But, on the other hand, it is well known that the musk sheep (*Ovibos moschatus*) a gregarious arctic animal, is of a dark brown colour. Now brown as a good absorber of heat, is only second to black. It is unnecessary to say more on this head than to observe that looking at the habits of musk sheep, colour in harmony with their surroundings would be of less service to them than a conspicuous colour. Their dark colour

enables them to readily see each other, therefore, when danger threatens, these animals can quickly flock together.

From this point my remarks will be confined to a consideration of the protective colour and mimetical markings of *Lepidoptera* only.

To the casual observer, the various hues and styles of ornamentation of the wing surfaces of *Lepidoptera* may appear to be distributed without particular object or method. If we look at a collection of set-out specimens, we shall probably be at a loss to say why this species is of a uniform green, and that species curiously mottled or striated with various shades of grey, red, or brown. To the Lepidopterist the colours and pattern of an insect are most intimately associated with the determination of species, but to the insect itself it is a matter of different import. It is essential to the insect that its colour and ornamentation should confer upon it a resemblance to some other natural object, peculiar to the situation in which it occurs, especially during its periods of repose. In fact, for its protection at such times it is necessary that the insect should be as unlike itself as ornate harmony with its surroundings can render it.

We can only properly understand how it is that the structure, colour, and pattern of an insect's wings can afford protection to the insect, by going out into the woods and fields, and there studying the normal habits of Butterflies and Moths when at rest. We shall then observe that the various species have peculiar methods of folding, expanding, or otherwise disposing their wings so as to accord with the material upon which they are reposing, or if not with the material itself, then with some other natural object, such as a leaf, tuft of lichen, stick, stone, or even an excrescence on the bark of a tree. The colours and pattern on the wings of the insects will be found to render the assimilation wonderfully complete.

In tropical regions numerous instances occur of species of *Lepidoptera* imitating or mimicking, not only other species of their own order, but also certain species of other orders. In Britain however, with the exception of the resemblance of the clear-winged Moths to Bees, Hornets, etc., there are probably no good examples of mimetic analogy. So this phrase of protective mimicry may be passed without further remark.

By way of illustrating the subject of this paper a few familiar examples of British *Lepidoptera* only will be referred to.

As is well known the genus *Vanessa* is composed of species whose wings are brilliantly coloured on the upper surface, and they are consequently noticeable objects even at a distance, but the under

sides of the hind wings of all the species are mottled and shaded with sober colours, so that when the insects are at rest on the trunks of trees, or even on the ground in the ordinary manner of butterflies in repose, that is with the wings raised vertically over the back, they are perfectly protected by reason of the complete harmony existing between the colours of the under sides of the hind wings of the insects and the object upon which they rest.

Darwin in *The Descent of Man* suggests that conspicuous colours are indirectly beneficial to many species as a warning that they are unpalatable. I am not aware whether or not this will apply to species of the genus *Vanessa*; if it does, then they are doubly protected, and can roam from flower to flower or bask in the pleasant sunshine without a thought of danger. I am inclined to think, however, that they do not enjoy entire immunity from attack when on the wing, or when settled with wings expanded. I have frequently watched the commoner species of the genus basking in the sunshine with their wings fully displayed, and have always observed that on the least shadow falling across them, they either took to flight or immediately closed their wings. This fact would suggest an instinctive knowledge of the protective nature of the under sides of their wings, and at the same time imply that they did not place implicit confidence in the deterrent properties of their brilliant colours. This is, however, a matter that I do not propose to go into in the present paper, it being my intention to treat of protective coloration of *Lepidoptera* only, in as far as it relates to the safety of the species in a state of repose.

Most of you will probably have had some experience with *Satyrus semele*, and will have observed how cleverly it eludes capture by the simple process of closing its wings. A specimen of this insect will alight on the ground a few feet in front of you. Then with net in hand you creep gently forward with your eye fixed on the spot where you saw *semele* settle, but only to find the insect vanished. You feel certain it cannot have flown away, still, you cannot see it; and whilst you are peering here and there *semele* darts from under your very nose, and settles again a few yards further on, there to repeat the same tactics.

The orange tip butterfly (*Euchloë cardamines*) again, is not difficult to see or capture when on the wing, but when at rest in its favourite position, that is, on the flower-heads of one of the *Umbelliferae*, the under sides of its wings harmonize with the flowers, and render its detection difficult. In *Thecla rubi* we have an example of bright

coloration confined to the under sides of a butterfly. This insect, as most of you will know, is brown on the upper surfaces of the wings, but the under sides are bright green. When danger is imminent it settles on a leaf, erects its wings over its back, and is effectually concealed.

Many other examples of protective coloration among Butterflies could be given, but I think those I have referred to will suffice. If you recall your experiences many instances will doubtless occur to you where you may remember to have noted a resemblance between the undersides of a butterfly and the object upon which it rested, but which you may possibly have considered only a coincidence and not as an illustration of protective coloration.

Among the *Bombyces* and *Notodontidæ* there are many remarkable imitations of bark, twigs, and withered leaves. For instance, *Cossus ligniperda* and *Stauropus fagi*, resemble the bark of trees on which they rest. *Phalera bucephala* rests on branches of trees or bushes, and the yellow patch on the hinder portion of its fore wings represents the fractured base of a recently detached twig. *Lasiocampa quercifolia* at rest is very like a cluster of dead leaves.

Several species of *Noctuæ* and *Geometræ* habitually rest on the trunks of trees, e.g., *Acronycta megacephala* on poplar, *Acronycta ligustri* on ash, *Tephrosia punctulata* on birch, *Eupithecia abbreviata* on oaks, and *Eupithecia rectangulata* on apple or crab. All these afford good illustrations of insects possessing colour and ornamentation in harmony with their resting-places. Most collectors of *Lepidoptera* will have observed these insects in repose, and will not have failed to remark how beautifully they assimilated with the bark of the trees upon which they were noticed.

Various species of moths are sometimes found on palings, but as a rule their occurrence in such situations is probably due to accident.

It is well known that when the wind has been blowing with some degree of force from a favourable quarter during the night, examination of fences in certain localities early the following morning, often results in the finding of numerous specimens of *Lepidoptera* ensconced thereon. At other times, long stretches of fencing will not yield a single moth. It may therefore be concluded that in the majority of cases moths rest on pales and other kinds of fencing rather from the force of circumstances than from the exercise of their own free will. Some few species of *Lepidoptera* do habitually, but not exclusively, repose on old fences, especially when such fences are plentifully covered with lichen. The lichen, for instance, would

afford food for the larvæ of *Cleora lichenaria*, and the perfect insect would find a safe resting-place thereon because the colours of insect and lichen would blend harmoniously together.

The great bulk of *Lepidoptera* conceal themselves during the day among the foliage of trees or bushes, or hide at the roots of grasses and other herbage. In whatever way they may rest, enemies of various kinds are ever on the alert, and wherever the moths may secrete themselves, they would be in danger of detection and seizure unless their structure, ornamentation, and colour either harmonized with their immediate surroundings, or counterfeited some natural object occurring near their resting-places. Possibly you may have met with that ubiquitous insect *Triphaena pronuba* hiding away under various plants in fields and hedgerows. It is not often seen among the foliage of plants, but generally on the ground and near the root-stock of the plant. In this position it is not unlike a stone, and for such an inanimate object I have frequently mistaken it, until I attempted to touch it, when it darted away and at the same time revealed its identity by exposing its yellow hind wings. *Agrotis strigula* (*porphyrea*) and *Anarta myrtilli* offer excellent examples of protective ornamentation. The colours of the fore wings of each of these insects blend admirably with the colours of the dead twigs and flowers of the heather, upon and among which these species rest. Species of the genus *Xanthia* agree in a striking manner with the dead and dying leaves of their food plants. Thus we see typical *Xanthia fulvago* (*cerago*) is in coloration exactly like a dying leaf of the willows *Salix aurita* and *Salix caprea*, even to the spots. The lemon-coloured variety of *Xanthia fulvago*, known as *flavescens*, is said to be chiefly bred from larvæ found feeding on the leaves or catkins of *Salix viminalis*, a narrow-leaved species of willow commonly called "osier." The insect in this case is smaller than the type, and is of the same tint of colour as the dying or defunct leaves of the osier. *Oporina croceago* is often found during the winter hibernating among the dead leaves of oak as they hang on the young or scrubby oaks growing in hedgerows, etc., on the borders of woods.

So far, except in the case of *Xanthia fulvago*, I have confined my remarks to what may be termed typical coloration; I shall now refer more particularly to variations from the type, and shall endeavour to show that such variation is not of the accidental character it is often supposed to be, but is closely connected with, or I should say influenced by, the nature of the insect's surroundings in different localities.

In speaking of an insect imitating or mimicking an object, such as a leaf, twig, bark, etc., it must not be supposed that the use of such terms imply conscious action on the part of the insect. As will presently be shown more fully, there is in all insects a tendency to vary; by the laws of inheritance, varieties are reproduced, and natural selection does the rest.

The offspring of all animals exhibit a general likeness to their parents, but individually they vary to a greater or lesser extent, not only one from the other, but also from the parent type. This is well exemplified in the *Lepidoptera*. If a series of any species in this order is examined, even though such series is formed of individuals of the same brood, it will be found that no two specimens of the series are exactly identical in every particular of structure, colour, and pattern of marking. In the case of species usually considered constant in colour and markings, the points of difference may be so trivial and minute as to escape detection unless the specimens are carefully and critically compared; but in a species of a polymorphic character, the divergence from the type and from each other is more pronounced, though there is a decided bias in favour of the parents where the series is composed of individuals of one brood. In any case, if variation from the type is of a nature to confer additional protection on the form so varying in any particular locality, then such form will possess an advantage over the type in that locality, and will probably supersede it, for, as Darwin in *Origin of Species* tells us, it is varieties of the same species and species of the same genus that come into the sharpest conflict in the great struggle for existence.

On the other hand, if the type is well protected by virtue of assimilation with its surroundings, and none of the varietal forms, which from time to time occur, improve upon the type in this respect, then the type will continue to prevail; but should the environment of the species become gradually altered in character, then the forms best fitted to exist under the changed conditions, will be perpetuated, and the former type being at a disadvantage will be gradually eliminated.

In *Boarmia repandata* we have a good illustration of a species which is either variable or constant in coloration according to the locality it inhabits and the nature of its surroundings in that locality. Thus for instance, in the Isle of Lewis, one of the Hebrides or Western Islands of Scotland, the species is represented by a small leaden grey form which in colour and style of ornamentation agrees

with the rocks upon which the insect habitually rests in that island. Mr. Jenner Weir has named this form *sodorensium* (*Entom.* xiv. 220).

I should say that the representatives of *B. repandata* in the Isle of Lewis are but little affected by crossing with forms from the mainland of Scotland, in fact the small size of the specimens is very suggestive of an impoverished strain, probably the result of isolation and consequent inter-breeding.

In some parts of North Devonshire *B. repandata* varies from a pale grey with few markings, through grey with ochreous tinge and distinct lines, to an almost uniform smoky grey brown, together with a predominant banded form (*conversaria*). This form also varies in depth and tone of colour. The species is common all along the coast district between Ilfracombe and Lynton, but it is found to be most variable in the charming little oak woods in the glens by the sea, and in those places the var. *conversaria* is more numerous than the type, if it be possible to speak of a type where all that are not of the banded form are of such various patterns and shades of colour.

Conversaria and the more or less typical forms rest on oak trees, and in this position the banded form is quite secure, its coloration harmonises with the lichen-clad oaks so well, that the insect's detection is a matter of difficulty. My first experience with the banded variety led me to suppose that this form would be easily seen when at rest; but what I observed of its habits afterwards convinced me that the first specimens of *conversaria* I had seen were—for some reason unfortunate in their resting-place. Occasionally *repandata* was observed sitting on old walls, also on rocks, of which latter masses of various sizes occur in all the woods. Many of the *repandata* captured or bred would have harmonised well in coloration with the rocks, but only few specimens were actually seen thereon.

The present sylvan character of those North Devonshire localities, to which reference has been made, is a feature of comparatively recent date, and is due to man's agency. Without doubt the low growing herbage, such as bilberry and heather flourished there, though perhaps not so luxuriantly, ages ago. Possibly birch and sallow of a scrubby growth may also have existed before the oak trees were planted. Then, as now, the larvæ of *Boarmia repandata* would feed on the bilberry and heather, and the perfect insects would probably rest on the rocks. After the oak trees were planted, and as they increased in size, the herbage, including bilberry and

heather would, under the fostering shelter of the trees, become more robust, growing and spreading in all directions, and gradually cover nearly the whole of the rocks, in consequence of which *repandata* would generally rest on the tree-trunks. Arboreal insect-eating birds would take up their abode in the young woods, and then commenced a struggle for existence between the varieties of *repandata* and that form best adapted by reason of its protective coloration, to exist under the altered nature of the locality would be preserved. Of course the best protected, and therefore predominant form of to-day (*conversaria*), did not acquire all at once the distinctive pattern of wing ornamentation we now find in this insect. As the nature of its habitat gradually changed from a treeless and rocky wilderness into a well-timbered wood with a luxuriant undergrowth, so first one, and then another of the varieties of *repandata* would be in the ascendant, but the tendency of the variation throughout must have been towards the character of marking now so fully developed in *conversaria*. In evidence of this we have the fact that the majority of the more or less typical *repandata* exhibit either a strong outline or a faint trace of the band of *conversaria*.

There are many other places in England where the *conversaria* form of *Boarmia repandata* occurs from time to time, but not in such numbers as to threaten to supplant the type. From one of these localities (Bristol) I received part of a brood of larvæ hatched from eggs deposited by a banded female. The nineteen larvæ produced ten typical *repandata*, and nine of the form *conversaria*. Unfortunately nothing of the male parent was known, but probably as *conversaria* only occurred sparsely in the locality, the male was of the typical form.

Types of some species of Butterflies and their named varieties are sometimes only slightly differentiated in colour and markings of the upper surfaces of the wings, but the under sides of the wings show considerable difference, for instance in the case of *Cænonympha typhon* and its varieties *laidion* and *philoxenus*. A pair of each of these insects are shown. On reference to the var. *laidion* it will be observed that the sub-marginal spots of the under side are either very small or entirely absent. This form occurs in Ireland and Scotland, but does not appear to have occurred elsewhere. The variety *philoxenus* is only found in the North of England, and is peculiar to the counties of Cumberland, Durham, and Yorkshire. If you compare this form with the type it will be found to possess an extra spot on the upper surfaces of the superior wings, situated

near the anal angle. You will also observe that the sub-marginal spots of the under sides of the inferior wings are large and distinct. Newman in *British Butterflies* considered this form as a distinct species, and it will be found in his work under the name *rothliebii*.

I have never had the pleasure of seeing *Cænonympha typhon* or either of its varieties in a state of nature, therefore I am not able to say anything positively of its habits during repose. *C. pamphilus* a near congener of *typhon* rests on the heads of rushes and coarse grasses, sometimes two or three examples on one head. I have often seen this species in repose, and can assert that the position selected is one well calculated to afford protection by reason of the complete harmony of the colouring and ornamentation of the under sides of the wings of the insects with the grass or rush heads upon which it rested.

In their various habitats the type and varieties of *Cænonympha typhon* may also assimilate with their resting-places. On the Yorkshire moors and mosses for example, it may be an advantage to the species that the spots and rings of its under wings should be of the size we observe in the form *philoxenus*, and in the same way small size or complete absence of spots on the hind wings of the var. *laidion* may also confer security upon that form.

Xylophasia rurea, and its variety *alopecuris* (*combusta*), affords an instance of marked difference between type and form of a species of *Noctua*. The normal habit of this insect is to rest among herbage at the roots of trees and bushes. Sometimes it may be found in the crevices of the bark of trees. In marking and coloration the type bears a strong resemblance to a piece of oak twig, or of a darker coloured stick from which the bark has been partly stripped. The variety, on the other hand, is not unlike a bit of birch or some such dark or reddish-barked twig. In some parts of Britain the variety is more frequently met with than the type, and in other parts the type is predominant. Another noteworthy fact is that where *combusta* and type are nearly or quite equal in point of numbers, intermediate varieties occur which connect the two extreme forms. From these facts I am inclined to infer that in certain localities, some parts of Scotland, for instance, the *combusta* form prevails because its colouring is in harmony with the general character of the *debris* in and about the resting-places of the insect in those localities. In the same way the lighter colour and arrangement of markings give protection to the typical *rurea* in those localities where it predominates.

Reference might be made to many other examples of types and

varieties of species being respectively coloured and marked in accordance with the peculiar character of their surroundings ; but in a short paper of this kind it is not possible to instance more examples. We will now pass on to a consideration of reproduction of varieties.

In the observations of *Boarmia repandata* var. *conversaria* it has been shown that in a portion of the progeny of a banded female nearly fifty per cent. favoured that parent. This fact is the result of the action of the laws of inheritance.

With the view of further illustrating how strong is this tendency to inherit the coloration of a parent, I exhibit four series of bred *Cidaria truncata* (*russata*). The four series represent the progeny of the captured females you see lettered respectively *A. B. C. D.* All the specimens of each set or brood are arranged in double columns above their proper female parents. The examples in the first column of each set more particularly favour the parent, except in the matter of size. (It is well-known that individuals of summer broods of *Lepidoptera* vary in size from individuals of spring broods.) In no case was anything known of the male parent of either of the series of *C. truncata* ; but we see that a large proportion of each series favour the female parent, and this is sufficient to show, that at least on one side, the parental coloration and device of the wings of a moth are transmitted to the progeny. In North Devon, where the female *Cidaria truncata* were captured, the form *A.* is predominant. In the case on the table, you will see five other captured specimens of this species lettered *E. F. G. H. I.* These examples are added to show the whole range of variation of *truncata*, in the coast district between Woody Bay and Lynton, in North Devonshire.

If you look at the series *A.* and *B.* you will see that nearly all the individuals of *A.* are of the same form as the female parent, whereas in *B.* sixteen examples only favour the female parent, ten others are in coloration something like the female parent of series *D.*, and two specimens are of the form *A.* From these facts I am inclined to suppose, that the male parent of the *A.* series was of the same form as the female of that series, and that the female parent of series *B.* paired with a male of the coloration of the *D.* female. Of course, this inference is ideal, and I only put forward the hypothesis that you may be induced to prove or disprove it by breeding this or other polymorphic species from parents which are either of different or identical forms.

I am strongly of opinion that by carefully selecting males and females to breed from, we might ultimately get nearly entire broods of a particular form of almost any species of *Lepidoptera* that will

breed freely in confinement. The reproduction of varieties in this way might be termed artificial employment of natural laws, and is analogous to the operations of the poultry, pigeon, or stock breeder. It is, however, performed by nature herself, but by the much slower process known as "Natural Selection." In nature, the forms of a species most nearly assimilating with their surroundings, or those which most successfully imitate other objects, escape their enemies, while the less protected forms of species fall victims, and a long continuance of this process will not fail to gradually, but surely, eliminate those less favoured forms, thus leaving the protected forms free to increase and multiply. These remarks do not apply to "hybrids," or certain phases of deformity. Hybrids are the result of unnatural union between opposite sexes of distinct species, and the offspring are sterile. Deformities are due either to accident or influence of some atmospheric condition.

In conclusion, I may say, that protective coloration of *Lepidoptera* is not a favourite subject with Entomologists generally, but I trust that the few remarks I have had the honour of reading before you this evening may induce those of you who do not already give attention to the matter, to take note of those moths you may find at rest in their native haunts, and see if you cannot trace some similarity between the insects and their resting-places, or some natural object adjacent thereto.

Now that the breeding of *Lepidoptera* from the egg is so generally practised among Entomologists, many good opportunities must occur for obtaining information upon the following points :—If of a species, more or less constant in colour and markings, a female differing from the normal type has been captured and fertile ova obtained therefrom, it would be interesting to ascertain to what extent the variation was reproduced in the offspring of that female.

In the case of a variable species, male and female known to be of different forms, as for instance, female type of *B. repandata* paired with male of the form *conversaria*. How many of the offspring favour the male? How many the female? How many of the brood are unlike either parent?

When the male and female are of identical form, as for example, var. *combusta* of *Xylophasia ruria*. What proportion of the offspring are of the parent type?

There is a wide field for experimental research in this direction, open to those Entomologists who are willing to sacrifice their rarer varieties in the enterprise.

LIST OF MEMBERS.

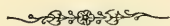
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- CARRINGTON, J. T., F.L.S., Savage Club, Savoy, W.C.
- CHAMPION, G. C., F.E.S., 11, Caldervale Road, Elm Park, Clapham S.W.
- CHANEY, W. C., *Hon. Librarian*, 96, Bird in Bush Road, Peckham, S.E.
- CLODE, W., 47, Phillimore Gardens, Campden Hill, W. (*Life Member*).
- COLE, W., F.E.S., Laurel Cottage, Buckhurst Hill, Essex.
- COLLETT, E. P., 76, Islip Street, Kentish Town, N.W.
- COOK, A. E., 31, Lower Road, Rotherhithe.
- COOPER, J. A., 1, Sussex Villas, Harrow Road, Leytonstone.
- COVERDALE, G., 24, Fleming Road, Lorrimore Square, S.E.
- CROKER, A. J., 58, Astbury Road, Queen's Road, Peckham, S.E.
- DOBSON, H. T., 3, Sycamore Villas, New Malden, Surrey.
- DOWNING, J. W., 59, Lupus Street, Pimlico, S.W.
- ELISHA, G., 122, Shepherdess Walk, City Road.
- ELEY, A. G., 84, Drakefell Road, St. Katherine Park, Hatcham, S.E.
- FICKLIN, A., Norbiton, Surrey.
- FREMLIN, H. S., 1, Margaret Street, Cavendish Square.
- FROHAWK, F. W., Park Place, Eltham.
- GASKELL, A., 23, Queen's Road, Peckham, S.E.
- GIBB, L., 185, High Street, Lewisham, S.E.
- GODWIN, F., 88, Carlisle Street, Edgware Road, W.
- GOLDTHWAITE, O. C., 2, Grove Villas, Grove Road, Walthamstow.
- HALL, T. W., F.E.S., 3, New Inn, W.C.
- HELPS, J. A., Newstead Lodge, Westhall Road, Forest Hill, S.E.
- HENDERSON, J., 58, Romolo Road, Herne Hill, S.W.
- HICKLING, G. H., Landon Cottage, Elm Road, Sidcup.

- HODGSON, A. E., Coleford, Gloucestershire.
 JOBSON, H., 3, Clarendon Road, Walthamstow.
 JOY, E., 15, Brownswood Park, South Hornsey, N.
 KENWARD, J., Redcliffe, Corona Road, Lee, S.E.
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 MERA, A. W., 68, Richford Street, Hammersmith.
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 PEARCE, A. E., " " " "
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 ROSE, A. G., 11, Kyverdale Road, Clapton.
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 TUGWELL, W. H., 6, Lewisham Road, Greenwich, S.E.
 URWICK, W. F., Clapham Common.
 WALKER, J., 23, Ranelagh Road, Sheerness.
 WEIR, J. J., F.L.S., F.Z.S., F.E.S., *Vice-President*, Chirbury, Copers
 Cope Road, Beckenham.
 WELLMAN, J. R., 8, Medora Road, Brixton Rise, S.W.
 WEST, W., *Hon. Curator*, 8, Ravensbourne Terrace, Lewisham
 Road, S.E.
 WEST, W., L.D.S., Cyprus Villa, Lewin Road, Streatham Common.
 WILKINSON, S. J., 22, Richmond Terrace, Clapham Road, S.W.
 WILLIAMS, J. T., 5, Woodland Villas, Foots Cray, Kent.

THE SOUTH LONDON
Entomological & Natural History Society

(Established 1872),

The Bridge House, London Bridge, S.E.



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Elected December 16th, 1886.

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Vice-President.

R. SOUTH, F.E.S.

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To whom all Communications should be addressed.

1886

125616

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,

THE BRIDGE HOUSE, LONDON BRIDGE, S.E.

The Society has for its object the diffusion of Biological Science, by means of papers, and discussions, and the formation of typical collections. There is a Library for the use of Members. Meetings of the Members are held on the 2nd and 4th Thursday evenings in each month, from Eight to Ten p.m., at the above address. The Society's rooms are easy of access from all parts of London, and the Council cordially invite the co-operation of all naturalists, especially those who are willing to further the objects of the Society by reading papers and exhibiting their specimens.

SUBSCRIPTION.

*Seven Shillings and Sixpence per Annum, with an Entrance
Fee of Two Shillings and Sixpence.*

All communications to be addressed to the Hon. Secretary,
W. H. BARKER,
148, Hollydale Road, Peckham, S.E.

PAST PRESIDENTS.

1872 ... J. R. WELLMAN.
1873 ... „
1874 ... „
1875 ... A. B. FARN.
1876 ... „
1877 ... J. P. BARRETT.
1878 ... J. T. WILLIAMS.

1879 ... R. STANDEN, F.E.S.
1880 ... A. FICKLIN.
1881 ... V. R. PERKINS, F.E.S.
1882 ... T. R. BILLUPS, F.E.S.
1883 ... J. R. WELLMAN.
1884 ... W. WEST, L.D.S.
1885 ... R. SOUTH, F.E.S.

1886 ... R. ADKIN, F.E.S.

REPORT, 1886.

ON reviewing the transactions of the Society for the past year, it is with great satisfaction that the Council have to report the continued vigour and increasing scope of its operations.

Its progress has been attended with a rapidly increasing membership, in itself a guarantee that the useful and interesting matter brought forward for discussion at the Society's Meetings, together with the wider range and thoroughness of its investigations into Biological Science, have been deservedly appreciated by the Members.

The regular attendance at the Meetings of the Society attests also to the enduring interest with which its work is regarded.

Since our last Report fifty-two new Members have been elected, three have resigned, and three have been struck off the books, leaving a total of one hundred and one.

Our financial position is also very satisfactory. After covering all expenses there is a useful balance left in favour of the succeeding year.

The Library has been enlarged by the following donations, viz. :—

"List of Yorkshire Lepidoptera." By G. T. Porritt, F.L.S.
From Mr. R. ADKIN.

"Catálogo de Los Lepidópteros, Chili." Por W. Bartlett-Calvert. From the AUTHOR.

"The Garner;" "Dictionary of British Plant Names" by Fitzgerald. From Mr. T. R. BILLUPS.

"Illustrated Science Monthly;" Vols. VI. and VII. of the "Dorset Natural History and Antiquarian Club;" "Midland Naturalist;" "Our Insect Enemies," by Theodore Wood; "Report on the Migration of Birds;" "Gapes

Disease ;” “Cornish Fauna—Vertebrate Animals and Crustacea ;” “The Hessian Fly,” by Miss Ormerod ; “Catalogue of Lepidoptera of Devon and Cornwall ;” “Goss’s Insect Fauna.” From Mr. J. T. CARRINGTON.

“Fauna and Flora of West Kent.” From Mr. T. D. A. COCKERELL.

“Entomologist’s Monthly Magazine” for 1886. From Mr. R. McLACHLAN.

“Entomologist” for 1886, and “Zoologist” for 1886. From Mr. T. P. NEWMAN.

“Annual Report of the Lancashire and Cheshire Entomological Society.” From the SOCIETY.

“Fauna of Blackheath and its Vicinity” (Part I.). Part IV. Vol. IV. “Transactions of the Entomological Society of London : On the Distribution of Lepidoptera in Great Britain ;” “List of Land and Freshwater Mollusca of East Sussex,” by J. H. A. Jenner ; “Variations in the Colour of Lepidoptera,” by J. J. Weir. From Mr. J. JENNER WEIR.

AND BY PURCHASE.

“Science Gossip” for 1886.

“Larvæ of British Lepidoptera,” by Buckler.

The Society’s Collection of Insects under the care of Mr. W. WEST, of Greenwich, has received the following addition :

A number of species of British *Lepidoptera* from Mr. J. T. CARRINGTON.

The Herbarium has been greatly enriched by :

125 species from Yorkshire, and 157 species from Rannoch. From Mr. J. T. CARRINGTON.

And a number of plants, including fifty species of mosses from Mr. T. D. A. COCKERELL.

The Society has also received a small Collection of British and Foreign *Mollusca* from Mr. T. D. A. COCKERELL.

The Excursions held this year were to

Horsley on May 29th.

Conducted by Mr. WINDYBANK.

Bookham on June 26th.

Conducted by Mr. STEP.

Westerham on July 17th.

Conducted by Mr. CARRINGTON.

Chobham on August 7th.

Conducted by Mr. BILLUPS.

Epsom on September 4th.

Conducted by Mr. CHANEY.

We must call attention to the project which has been developed of collecting material for the publication of a Fauna of Kent, Surrey, Sussex, Hampshire, and Berkshire, to which further reference will be made in the President's Address.

WALTER A. PEARCE,	} <i>Hon. Secs.</i>
H. W. BARKER,	

THE SOUTH LONDON ENTOMOLOGICAL

BALANCE SHEET FOR

GENERAL

RECEIPTS.

	£	s.	d.
To Balance from last Audit, Dec. 17th, 1885	10	9	5
„ Subscriptions and Entrance Fees	31	8	6
„ Contribution towards Cost of "Proceedings"	2	2	0

£43 19 11

PUBLICATION

To Special Donations	11	0	0
„ Sale of "Proceedings"	0	15	0

£11 15 0

LIBRARY

To Special Donation	0	10	0
„ Library Fines	0	17	8

£1 7 8

ASSETS.

To Cash Balance, General Fund ...	9	5	9
„ „ Publication „ ...	1	5	0
„ „ Library „ ...	1	7	8
	<u>11 18 5</u>		
„ Estimated Realisable Proportion of Arrears	3	0	0

£14 18 5

Audited, compared with vouchers, and found correct,

AND NATURAL HISTORY SOCIETY.

THE YEAR 1886.

FUND.

EXPENDITURE.

	£	s.	d.
By Rent	10	2	6
„ Printing	9	14	0
„ Expenses of Annual Exhibition	9	3	10
„ Postage and Stationery	5	0	11
„ Sundries	0	12	11
„ Balance in hand	9	5	9
	<u>£43 19 11</u>		

FUND.

By Engraving	3	3	0
„ Printing	7	7	0
„ Balance in hand	1	5	0
	<u>£11 15 0</u>		

FUND.

By Balance in hand	1	7	8
	<u>£1 7 8</u>		

LIABILITIES.

By Rent due at Christmas, 1886	1	10	0
„ Balance of Assets over Liabilities	13	8	5
	<u>£14 18 5</u>		

December 16th, 1886.

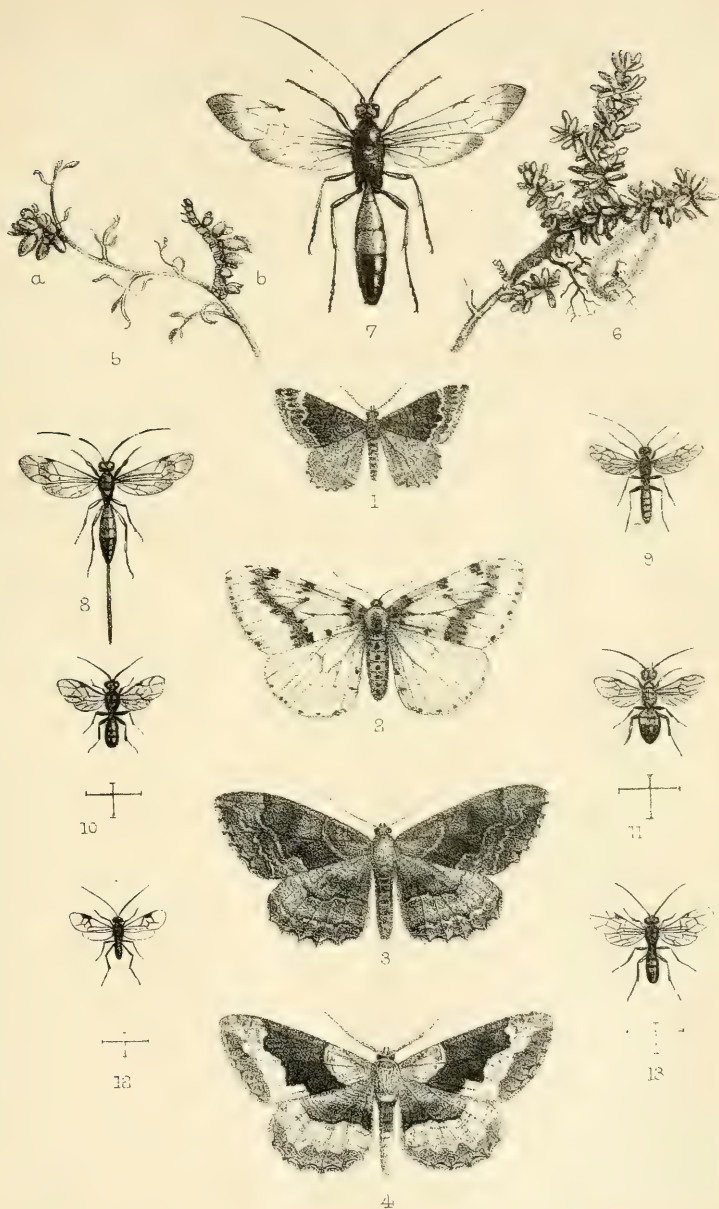
THOS. WM. HALL, }
J. W. TUTT, } *Auditors.*

EDWARD STEP, *Treasurer.*

PLATE I.



- Fig. 1. *Larentia olivata*, Bork. (var.), page 53.
,, 2. *Abraxas grossulariata*, L. (var.), page 46.
,, 3. }
,, 4. } *Boarmia repandata*, L. (vars.) page 46.
,, 5. Larva of *Phorodesma smaragdaria*, Fb. (*a* At rest; *b* extended), page 53.
,, 6. *Zygæna exulans*, Hoch. (pupa case among crowberry) page 64.
,, 7. *Trogus alboguttatus*, Gr., page 62.
,, 8. *Echthrus lancifer*, Gr., page 58.
,, 9. *Perilisus triangulatus*, Bridgm., page 73.
,, 10. *Erromenus plebejum*, Wolds., Foerst.. page 73.
,, 11. *Cleptes nitidula*, Latr. (male), page 48.
,, 12. *Apanteles jucundus*, Marsh. page 63.
,, 13. *Bassus bizonarius*, Gr., page 73.



PRESIDENT'S ADDRESS.

GENTLEMEN,

In accordance with the usages of this Society it is my pleasing duty to address you on its progress during the year now drawing to a close. With this object in view I do not propose to enter in detail upon the earlier history of our Society ; that is probably known much better to many of you than to myself, and it is with great pleasure that I observe our first President among us this evening ; but as many of the members now present have joined us at comparatively recent dates, it may not be amiss to glance very briefly at our position from time to time during the fourteen years of our existence.

Founded under favourable circumstances in the year 1872, the Society appears to have met with considerable support ; and at the close of 1879, the membership had reached the respectable total of 94. About this time, however, a period of depression set in. At the termination of the following year we find, by the report of the Council, that "the membership had not increased," and a falling off is from time to time recorded, until, at the Annual Meeting of 1883, the number of members on the Society's books stood at only 44, the cash balance in the hands of the Treasurer at less than £3, and the Council had to make the unpleasant confession that "secessions from us have considerably weakened our Society." Times of adversity often father prosperity. So in our case ; despite the untoward events in regard to our place of meeting, which are, I doubt not, fresh in the minds of many of you, the membership began again, slowly but surely, to increase, and the Treasurer's balances to become more substantial, until, at the end of last year, we were able to show a list of some 55 members, and a cash surplus of over £10, and there

appeared to be good reason for looking with confidence to the future.

This brings me to the period more directly under our notice this evening.

Since our last Annual Meeting we have elected 52 members, many of them men of repute and considerable experience in various branches of Natural History; happily, death has caused no breach in our ranks; there have been but 3 resignations, and 3 names have been written off, so that our membership at the present moment stands at 101, a total with which we have every reason to be satisfied for the time being.

The Treasurer's balance, as you have already heard from the statement that he has so clearly put before you, compares favourably with last year, and the finances of the Society continue to maintain a thoroughly sound condition.

The Rules of the Society have, from time to time, been modified in some particulars to meet the requirements of our altered circumstances; they are, I believe, now out of print, and I would suggest that their revision, as a whole, might, with advantage, receive the early attention of the Council with a view to their presentation to a special meeting for confirmation, pending a re-issue.

The improved attendance of members at our meetings continues, and much business of an interesting character has been transacted. The Exhibits also have been more numerous, and have included objects of considerable interest in various branches of Natural History, and in many cases the reading of short notes has materially added to their importance. I cannot too highly commend this practice. Often an Exhibit that in itself appears to have little to recommend it, and which may even be passed over comparatively unobserved by the bulk of those present, will, when particulars concerning it are known, become of some scientific value, and induce discussion that is calculated to throw light upon matters, producing results otherwise unattainable; and I venture to think that those who are good enough to favour

us with such notes, are justly entitled to the undivided attention of the meeting, while they are reading them.

It is to be regretted that more papers have not been read before the Society, the three with which we have been favoured, one on the *Entozoa*, by Mr. W. West (Streatham), one by Mr. R. South, on *British Snake-like Reptiles*, and another by Mr. E. Joy, *On collecting Lepidoptera at Wicken Fen*, afforded much information on their respective subjects, and added considerably to the interest of the meetings at which they were read, and the thanks of the Society are due to their authors for the great care evinced in their preparation. I am happy to be able to state that there is a prospect of a larger number being brought forward during the coming year; indeed, I am given to understand that some few have already been promised; and we may, therefore, hope to have the benefit of them at no very distant date.

It is also a matter for regret that so little has been heard of our corresponding members. There appears to be a prevailing impression that a corresponding member has simply to pay his half-crown a year, receive in return any matter that may be printed by the Society for the use of its members, and rest contented. But surely he has greater privileges than these? He is enabled to become a *corresponding* member by reason of his place of residence being more than twenty miles from London; but that is no reason why he should not have the advantage of bringing his queries before the meetings. I am sure that our Secretary will be only too happy to read to the meetings any correspondence that he may from time to time be pleased to send up, to our mutual advantage; and, I trust, that in the future we may hear more of our corresponding members in this wise than has been the case of late.

During the summer months five excursions were held, the localities visited being Horsley, Bookham, Westerham, Chobham, and Epsom. In the majority of cases it was new ground to the members, and the thanks of the Society are due to Messrs. Windybank, Step, Carrington, Billups, and

Chaney, for the arrangements made, and personally conducting on the respective occasions. The first three were well attended, and some interesting captures made, as well as much productive-looking ground explored; but the two last, owing probably to their dates falling at a time when many members were from home, coupled with the lateness of the season, produced but small musters; and it will be a question for the New Council, when considering the list of excursions for the coming year, whether even better results might not be obtained by shortening the programme.

The plan of our Exhibition this year was laid on a much larger scale than anything that has been attempted by the Society in recent years, and in the result proved a success fully justifying the most sanguine expectations. The Exhibits were exceedingly numerous and varied, and represented many branches of general Natural History; the more minute specimens shown under microscopes contributing in no small degree to the usefulness of the Exhibition, from a scientific point of view. It is to be regretted that, owing to the dense fog that prevailed in the southern suburbs, we were deprived of the assistance of some few of our old and much esteemed members. We were, however, favoured by a very large attendance of members and visitors, including many distinguished Entomologists and workers in other branches of Zoology, many of whom very kindly exhibited most interesting specimens, as did also the Zoological Society of London. To these, as well as to the Royal Microscopical Society, the South London Microscopical and Natural History Society, and several other Microscopical Societies, and the Lambeth Field Club, we are indebted for much valuable assistance on the occasion, and I take this opportunity of thanking them on behalf of the South London Entomological and Natural History Society. I have no hesitation in saying that the success of this undertaking was mainly due to the disinterested manner in which the general body of members worked together with that one common object in view; but I should be remiss in my duty were I to omit

to mention the Committee entrusted with the perfecting of the arrangements, namely, Messrs. Barker, Billups, Pearce, South, and Step, to whose untiring energy I have very great pleasure in bearing testimony.

Many valuable additions have been made to our Collections and Library, and the best thanks of the Society are due to the respective donors. Our Curators and Librarian continue to exercise their accustomed care in the preservation of the objects in their charge.

A feature in the management of the Society during the year has been the delegation to small committees of matters requiring that continued and undivided attention which it is impossible for the Council to give in the hour allotted to them in each month : the system so far has worked admirably, and I see no reason why it should not be more extensively applied, with good results. As an illustration of its working I am able to say that the somewhat voluminous reports of our meetings have been carefully revised to the end of November ; and should it be decided to print them in abstract form, there is no reason why they should not be issued early in the coming year.

In his Address to you at the last Annual Meeting, my worthy friend and predecessor, Mr. South, said that "Among the many useful labours that should be undertaken by a local Natural History Society, is the compilation of the Flora and Fauna of its own particular district or county," and further suggested that this Society was well qualified to take in hand the preparation of such work. You will, no doubt, remember, that early in the New Year the question was brought forward at one of our meetings, and a resolution passed empowering the Council to collect and arrange the necessary material for such a Fauna. The matter having been sifted by the Council, it was decided that the area to be covered should include the counties of Kent, Surrey, Sussex, Hampshire, and Berkshire, being in effect the five counties South of the Thames, from its source to outfall, and elected a Committee to make preparations for carrying out the work.

Within the last few days a circular and outline have been issued to you, setting forth, in some detail, the plan upon which it is proposed to proceed, accompanied by a map which I may term the foundation on which to build up the work. I need not point out to you that the preparation of a map containing so much elaborate detail is a work of much skill, and necessitating the expenditure of a large amount of time; and I take this opportunity of congratulating our esteemed Secretary, Mr. W. A. Pearce, to whose unaided labours we are indebted for its production, on behalf of the Society, upon the very able manner in which he has completed the arduous task so willingly undertaken by him.

From the numerous offers of assistance already received, both from members and friends of the Society, there is good reason for believing that abundant material will be forthcoming; and I cannot urge upon you too strongly the desirability of every member giving the fullest information in this respect.

The promised "descriptions of the various catchment basins" are already in course of preparation, and there appears to be every probability that the work of compilation will proceed forthwith.

It is, perhaps, premature to speak upon the subject of publication further than is mentioned in the outline plan already referred to; but I may be permitted to say that the comprehensiveness of the work and the rate of publication must largely depend upon the available means for the time being, and that, however important the work may prove itself to be as it progresses, it must not be allowed to become a drain upon the ordinary resources of the Society. It is probable that a scheme bearing upon the subject may ere long be brought before you; but in the meantime a special publication fund (that has received sufficient support to provide for the printing of the maps, circulars, etc., without trenching upon the ordinary funds of the Society) has been opened, and to this I would direct your attention.

During the year some few additions have been made to the British Insect Fauna, from which I note the following :—

Coleoptera :—

Euclenaria capucina, Ahr, was exhibited at the Entomological Society's meeting on July 7th, by Rev. H. S. GORHAM. The specimens were discovered, in June last, in an old beech tree in the New Forest. ("Proc. Ent. Soc.," 1886, xxx.)

Langelandia anophthalma, Aubé., was first taken by Mr. THEODORE WOOD, at St. Peter's, Kent, in May last, where he found it in some numbers in decaying seed potatoes ("Ent. Mo. Mag." xxiii. 93), and specimens were exhibited at the Entomological Society's meeting on August 4th. ("Proc. Ent. Soc.," 1886, xxxvii.)

Anchomenus sahlbergi, Chaud. At page 264, vol. xxii., "Ent. Mo. Mag.," the Rev. W. W. FOWLER describes this species from three specimens taken by MR. HENDERSON on the banks of the Clyde, below Glasgow, about twenty years ago ; it had not before been found in Europe.

Lepidoptera :—

Botys repandalis, Schiff. MR. C. G. BARRETT, in the "Ent. Mo. Mag." xxiii. 145, identifies as this species some Pyrales bred some time since by Rev. HENRY BURNEY, from larvæ found feeding in the heads and young shoots of *Verbascum nigrum* on the south coast of Devon. To quote MR. BARRETT's words, "This species is a welcome and extremely interesting addition to the British Fauna."

Two species are contributed by MR. JOHN H. WOOD of Tarrington, Ledbury, viz. :—

Lithocolletis distentella, H.-S., and *Nepticula desperatella*, Frey, bred from larvæ mining in the leaves respectively of oak and wild apple ("Ent. Mo. Mag." xxii. 261 ; xxiii. 188).

Heydenia auromaculata, Frey, a species closely resembling *Ecophora fulviguttella*, Zell., is recorded by MR. C. G. BARRETT, as having been taken in Shetland some time since, but not previously identified ("Ent. Mo. Mag." xxiii. 13).

Cateremna terebrella, Zk., has been bred by LORD WALSLINGHAM from larvæ found in small aborted cones of *Abies Douglasii*, near Thetford, Norfolk ("Ent. Mo. Mag." xxiii. 82).

Cosmopteryx schmidiella, Frey, is recorded by Mr. W. H. B. FLETCHER as having been found by him in the larval state in leaves

of *Vicia sepium* growing in low damp hedgerows near Worthing, Sussex. ("Ent. Mo. Mag." xxiii. iii.)

Hymenoptera :—

In the *Ichneumonidæ* we have several additions, among them :—

Meteorus luridus, Ruthe., obtained by MR. BIGNELL.

Bassus bizonarius, Gr., taken at Peckham, and

Echthrus lancifer, Gr., from Walmer, both by MR. BILLUPS. Our indefatigable member also contributes two new Braconidæ, namely, *Chelonus carbonator*, Math., taken at Bookham, and *C. speculator*, Math., from Benfleet, Essex; and ("Ent. Mo. Mag." xxii. 228) Dr. Capron describes two others, *Bracon Westmæli*, Wesm., and *Ascogaster canifrons*, Wesm., which, though taken previously, are only now identified.

Diptera :—

MR. G. H. VERRALL describes one hundred new species ("Ent. Mo. Mag." xxii. 179), and MR. PETER INCHBALD, two, namely, *Cecidomyia muricatæ*, Meade ("Entom." xix. 152), and *C. clausilia*, Bouché ("Entom." xix. 223).

In this order we must not omit to mention the recently determined corn-pest *Cecidomyia destructor*, Say, which has caused some consternation among our agriculturists, and for particulars of which I cannot do better than refer you to Miss E. A. Ormerod's concise little pamphlet, published by Simpkin, Marshall & Co., at the moderate price of 6d.

Neuroptera :—

For the only addition in this order we are indebted to MR. R. M'LACHLAN, who describes *Kolbia quisquilarum*, Bertkau, a genus and species new to Britain, taken in the New Forest ("Ent. Mo. Mag." xxiii. 38).

From the foregoing it will be seen that the year has been by no means deficient in novelties, and among the rarer Lepidoptera and occasional visitors in that order, several interesting notes have been from time to time made.

A single specimen of *Papilio machaon*, L., is recorded as having been taken between Herne Bay and Whitstable, Kent, by Mr. Martin Jacoby, and is perhaps worthy of mention on account of the unusual locality for the species.

Colias edusa, Fb., so common last year, has been noted but very sparingly during the past autumn, the only records of its occurrence, so far as I am able to ascertain, being some ten specimens at St. Leonards ; three (including one var. *helice*, Hb.) at Deal ; two at Eastbourne ; and one each at Chichester, Folkestone, Maldon, Swansea, and Christchurch, in all some twenty examples. And one specimen of *Vanessa antiopa*, L. was taken by Mr. W. H. Pemberton-Barnes, in his greenhouse at Havering-atte-Bower, Essex ("Entom." xix. 248).

But perhaps the most interesting of the recent additions to the British Butterflies (if we except *Lycena argiades*, Pall., introduced to our lists last year, but which has this year been conspicuous by its absence) is *Anosia plexippus*, L. From an exhaustive paper on this species by Mr. James J. Walker, R.N., F.E.S., published in the "Ent. Mo. Mag." xxii. 217, we learn, that starting from its American home, it rapidly colonized the numerous groups of South Pacific Islands, and eventually established itself in Australia ; but its Eastern march appears to have been more difficult to accomplish, the great expanse of ocean (over 2,000 miles) between the American Continent, and the first resting-place in our direction, may have offered obstacles requiring unusually favourable surroundings to overcome them. In due time, however, it reached our shores, and a specimen was taken at Neath, in South Wales, by Mr. J. T. D. Llewelyn on 30th September, 1876, just ten years ago ("Ent. Mo. Mag." xiii. 107), and single examples have been recorded from time to time up to last year, when fully a dozen were accounted for, quite half of them from Cornwall. We do not, however, appear to have any mention of its occurrence on the Continent of Europe until the present year ; it is therefore interesting to note its capture at Gibraltar ("Ent. Mo. Mag." xxiii. 162), and a specimen is also recorded from Guernsey ("Entom." xix. 278), facts pointing strongly to a continued eastward range and probable permanent settlement within our coasts. The number of records of its capture in this country during the past summer show that it probably existed in some numbers, its range apparently being from

Cornwall to Hampshire, on the South Coast; and on the West, one specimen is noted from Pembroke.

Among the Sphingidæ I note *Acherontia atropos*, L., is far less commonly mentioned than was the case last year, the only records being one taken at Greenwich by our Member, Mr. C. Levett, on the 18th May, in fine condition ("Entom." xix. 157); and this capture appears to be of some importance as pointing to a spring emergence; three specimens in Shetland ("Entom." xix. 279), four at Leominster, and one each at Howth, Ireland ("Entom." xix. 279), and Dartlington, South Devon ("Ent. Mo. Mag." xxiii. 162).

Sphinx convolvuli, L., on the other hand, appears to have been fairly common in many parts of the country. Mr. Dover C. Edgell records the capture of many specimens on flowers in a garden at Lewes ("Entom." xix. 300), and it has also been taken at various other places, from South Devon ("Entom." xix. 280) to Aberdeen ("Entom." xix. 249).

A specimen of *Deilephila euphorbiæ*, L., is recorded from Bowden, near Manchester, by Mr. Joseph Chappell, who suggests that having both wings on one side crippled, it could not have flown, and must have emerged near the place of capture ("Ent. Mo. Mag." xxiii. 108; "Entom." xix. 250). Two specimens of *Chærocampa celerio*, L., are reported from Lewes ("Entom." xix. 300), and one from Hastings ("Entom." xx. 16), and one of *C. nerii*, L., from Brighton, the latter by Mr. T. Langley ("Entom." xix. 250).

We have also records of *Deiopeia pulchella*, L., one specimen taken at Ramsgate by Mr. Theodore Wood ("Entom." xix. 280); *Callimorpha hera*, L., which has again been turned up in some numbers in South Devon, by the assiduity of our member, Mr. J. Jäger ("Entom." xix. 250); and *Leucania vitellina*, Hb., taken at sugar at Finchley, Middlesex, by Mr. W. T. Sturt ("Ent. Mo. Mag." xxiii. 110), noticeable chiefly on account of the unusual locality.

The year has been by no means unproductive of literature bearing upon subjects connected with Natural History, and among the more important works on Entomology I may

mention the following: "The Larvæ of British Butterflies and Moths," by the late William Buckler, Vol. I. "Butterflies," being the Ray Society's vol. for 1885, but issued only in the early part of this year. It contains coloured illustrations of the larvæ of the majority of our British Butterflies, with descriptive notes upon their life-histories.

The "British Pyralides" (including the Pterophoridæ) by J. H. Leech, B.A., F.L.S., F.Z.S., etc., recently published, should prove a useful addition to the somewhat scanty literature upon this particular group of Lepidoptera. The volume contains upwards of a hundred pages of letterpress, devoted mainly to the descriptions and habits of the larvæ; localities; notes on the more important varieties of, and chief distinguishing characters between, closely allied species; and eighteen admirably coloured plates, in which the greater portion of the imagines are delineated. (London: R. H. Porter, 6, Tenterden Street, W.)

The "Coleoptera of the British Islands," by Rev. W. W. Fowler, M.A., F.L.S., Sec. Entom. Society, etc. is now publishing in monthly parts, in two editions, the one containing letterpress, the other letterpress and carefully coloured plates, and will probably form, when completed, one of the most important works on the subject. (London: L. Reeve and Co., 5, Henrietta Street, Covent Garden.)

In other branches of Natural History we have "A History of British Birds" (with coloured illustrations of their eggs), by Henry Seebohm, sixth and concluding volume. (London: R. H. Porter.)

"British Fungi." By Rev. John Stevenson. Vol. 1. Agaricus—Bolbitus. Illustrated with some woodcuts. (W. Blackwood & Sons, Edinburgh.)

"Illustrations of British Fungi," by Dr. M. C. Cooke. Vol. 4, bringing the total number of species illustrated up to 790.

In the early part of this address I congratulated you upon the immunity of our Society from loss of any of its members by death, but death has been very near our doors. In the early days of the year we heard with regret that EDMUND

SHUTTLEWORTH, a gentleman who had for many years taken a considerable interest in Entomology, had been taken from us. Mr. Shuttleworth was known to several of our members, and he had signified his intention of offering himself as a candidate for membership, but his untimely decease prevented his intention being carried into effect.

And looking further, to the ranks of the great body of students of Biological Science, we have to deplore the loss of many learned men and ardent workers; among them:—

REV. C. S. TRESS-BEALE, M.A. More than thirty years ago, when living at Tenterden, Kent, he supplied that locality where cited in Stainton's "Manual of British Butterflies and Moths." He afterwards resided at Alkham, near Dover, where he added the pretty *Cnephasia cinctana*, Schiff., to our lists, and ultimately returned to Tenterden, where he died, Dec. 23, 1885.

J. B. JEAFFRESON, M.R.C.S., for some time President of the Highbury Microscopical Society, and well known in the North of London as a diligent worker with the microscope in biological research, died Jan. 12th.

Rev. W. W. NEWBOULD, F.L.S., died April 16th. His special study was our native British plants, and several of our local county floras owe much to his co-operation.

THOMAS EDWARD, immortalised by Smiles in his "Life of a Scottish Naturalist," died April 27th. Born on Christmas-day, 1814, he early in life showed a great love for mammals, insects, and creatures of every description, and many amusing anecdotes are told to illustrate his extreme fondness for even the most repulsive subjects in the animal kingdom. His researches added greatly to the knowledge of Natural History, as he embodied his new discoveries in papers written to scientific magazines, etc. After the publication of his biography by Smiles, he was raised from comparative poverty to a condition of comfort by the presentation to him of some £300, the result of a subscription, and the award of an annual pension of £50 by the Queen. Recently a scheme has been set on foot for the erection, by subscription, of a

memorial to his memory, in which the town council of Banff are taking a leading part.

JOHN ARTHUR POWER, M.D. By the death of Dr. Power, which took place at Bedford, on Thursday, June 10th, Entomologists, and especially Coleopterists, have lost a good friend and an ardent worker. To his energy and perseverance we are indebted for many additions to our list of British Coleoptera; and numbers of species, previously regarded as great rarities, were, by his aptitude for becoming acquainted with their habits, found to exist far more commonly than was generally supposed. He became a member of the then recently formed Entomological Society of London, in 1834, but appears to have resigned his membership some ten years later. In 1856, he was chosen a member of the Entomological Club, and continued so until the day of his death.

ARTHUR GROTE, F.R.S., F.L.S. Born 1814, died December 4th. He wrote a number of papers on subjects connected with Botany and Zoology and contributed an introduction to Hewetson's "Descriptions of New Indian Lepidopterous Insects in the Atkinson Collection."

So much, gentlemen, for the year now rapidly drawing to its close; and in conclusion I beg to express to you my sincere appreciation of the honour you did me in electing me your president, of the kindly way in which you have overlooked my many shortcomings, and the courtesy and support that you have at all times so willingly extended towards me.

To the Officers and Council my thanks are especially due. Their many good qualities are too well-known to you to need any special mention at my hands.

I am quite sure that you have learned, as I did, with much regret, that Mr. W. A. Pearce finds it incumbent upon him to withdraw from the office of Secretary, and I feel that I am only expressing your sentiments when I say that the Society fully appreciates the able manner in which he has discharged the arduous duties devolving upon him in that capacity. In

Mr. H. W. Barker, whom you have selected to succeed to this all-important post, and who has for more than twelve months carried on a material portion of the secretarial work, we are fortunate in having a gentleman of unusual ability, and who I have no hesitation in saying has the true interests of the Society at heart.

This year has been one of progress. We have every reason to be confident in the immediate future ; the field before us is great. Let me conclude with the wish that our Society may "go on and prosper."

ROBERT ADKIN.

ABSTRACT OF PROCEEDINGS.

JANUARY 7th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. W. A. Pearce exhibited *Deilephila lineata*, Fab. from California.

Mr. South exhibited and made some remarks upon the following *Zygænidæ*:

Zygæna transalpina, Esp. Valleys of the Southern Alps.

„ „ var. *hippocrepidis*, Hüb. Germany, France, and Belgium. Common.

„ *filipendulæ*, L., from Folkestone, July.

„ *trifolii*, Esp., var. *dubia*, Staudinger, *transalpina*, Hüb.

„ *filipendulæ*, L., var. *ochsenheimeri*, Zeller. Generally considered a South European insect, occurring in the South of France, valleys of the Southern Alps, Italy, and Greece. It is the *transalpina* of Ochsenheimer, and is by some considered a distinct species.

Mr. J. Jenner Weir exhibited specimens of the spring and autumnal emergences of *Lycæna argiolus*, L., among which was a specimen of the autumnal brood very closely resembling an American species, *Lycæna pseudargiolus*, Boisd. ; whilst another was almost the colour of *L. corydon*, Fb.

Mr. Weir said, it was generally known that the females of the spring brood laid their eggs on the flowers of the holly ; whilst those of the autumnal brood laid theirs on the flowers of the ivy. He had noticed that while this insect was double-brooded in his garden at Blackheath and various other places,

it was single-brooded at others. Mr. Harcourt Bath, writing on the subject, had stated that in the Midlands (Birmingham) the species was only single-brooded. Mr. Weir added that he had tried a great number of times to obtain specimens of the autumn brood from the Gullivers in the New Forest, and they said they had never seen an example of the species in the autumn.

In those parts of the New Forest in which holly is abundant, *L. argiolus* is very common in the spring; ivy, on the other hand, is generally scarce in the forest. He had himself spent considerable time in the neighbourhood of Brockenhurst, where the insect is most plentiful, trying to find the ivy-feeding larvæ. He had found very little ivy, and no *Lycæna* larvæ among that examined.

It was a singular possibility of this insect having a brood suppressed through the proper pabulum being absent. He could not say himself whether it was so or not, but the Gullivers, old foresters, born in the forest, and keen observers of insect life, ought to know. Was the brood suppressed through want of pabulum? And if so, he thought it was a new idea and well worthy of the consideration of the Society.

Weismann certainly had succeeded in suppressing the summer brood of *Pieris napi*, L., by putting the pupæ on ice, when, instead of A producing B, A produced A indefinitely. It was just the same in the Alps, the variety of *P. napi*, *bryonia*, Hüb. having only time to make one emergence.

He would ask the members of the Society to capture *L. argiolus* whenever they saw it, carefully label it with time of year and where taken, whether ivy was there as well as holly, and add any other information or further note which might be of interest.

Several members made observations on these remarks and it was the feeling of all present that members of the Society would gladly render what assistance they could to Mr. Weir in clearing up this question.

JANUARY 21st, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. F. W. Frohawk exhibited specimens of the curious ichneumon *Allysia manducator*, Panz., bred from the coleopteron, *Creophilus maxillosus*, L.

Mr. T. R. Billups exhibited male and female specimens of *Sirex gigas*, L., and read the following notes :—

“ The species exhibited belongs to the family of Siricidæ (Tailed Wood Wasps), the larvæ of which are very destructive to timber, more especially fir-trees. The female lays her eggs in living wood, and the larvæ live for many years in the interior. They are not only very destructive to plantations, which have been destroyed by the borings of these insects, but they have been known to be a terror to whole households. Kirby and Spence, in one of their letters upon indirect injuries caused by insects, give an instance of this, in which several specimens of *S. gigas*, were seen to come out of the floor of a nursery in a gentleman's house, to the great discomfiture both of nurse and children. Another instance, upon the authority of Mr. Ingpen, is also worth mentioning, and occurred in the house of a gentleman at Henlow, Bedfordshire, from the joists of the floor of which, swarms, literally thousands of *Sirex*, emerged from innumerable holes large enough to admit a small pencil-case, causing great terror to the occupants. Numerous other references might be made to the destruction caused not only to woods and plantations, but to houses after they have been built some three or four years. But I cannot help quoting another instance, showing how powerful the mandibles of the larvæ are ; lead itself not being impervious to its attacks. Marshall Vaillant presented to the Académie des Sciences in 1857, some packets of cartridges containing balls which had been pierced through by the larvæ of the *Sirex*, during the sojourn of the French troops in the Crimea : some of these insects were still shut up in the galleries which they had hollowed out in the metal. Then M. le Marquis de

Brême in the year 1844 also exhibited before the Société Zoologique many cartridges, the balls of which had been perforated to the depth of a quarter of an inch. These cartridges appear to have come from the arsenal of Turin, packed in barrels made of larch-wood; after leaving which, the insects gnawed through the envelopes of the cartridge, and at last into the balls themselves.

"I might give many more instances; but I think I have said enough to show the very great rapacity, as also the strength of mandibles of these destructive creatures. But I must not close these few remarks without calling your attention to a most valuable ally which comes to our assistance in keeping down the very prolific *Sirex*; and that is no other than the delicate and fragile parasite, *Rhyssa persuasoria*, L., of the family of *Ichneumonidæ*, the long ovipositor of which is well adapted for finding its host in the gallery made by *Sirex*, in the larvæ of which the female deposits her eggs, checking in a great degree the increase of that species. In Canada, many people imagine that it is the *Rhyssa* which kills the trees by 'stinging' them, as they term it; and as often as they see it, they heedlessly destroy the very creatures which help to lessen the real enemy of the tree, whose works are more secret and deep. Species of the genus *Rhyssa* occur all over the world, but probably not more than twenty-four or twenty-five species have been described, two only of which occur in this country, namely, *Rhyssa leucographa*, Gr., and our friend, *R. persuasoria*, L.

"Mr. Bond observes that '*Rhyssa* actually bores through the solid wood to deposit its eggs in the larvæ of *Sirex*; the ovipositor being worked into the wood like an awl.'"

Mr. Billups also exhibited specimens of *Rhyssa persuasoria*, from Chobham.

Mr. Dobson exhibited two specimens of *Acherontia atropos*, L., and said he obtained three pupæ of the species last autumn; about the 20th November the pupæ to all appearance were dying, he then placed them in a tem-

perature of between 60° and 70° F., with the result that one died, the others revived under the warmth, and in five weeks, six days, one emerged, and the other in six weeks, three days, coming out respectively on the 2nd and 5th of January.

Mr. Carrington mentioned that he had known two collectors in the north, who were very successful in rearing this insect by artificial means, and used to get all the perfect insects out before Christmas; and made similar remarks in reference to *Deilephila galii*, Schiff.

Mr. South said he had on one occasion obtained a pupa from Dartford, which he left in the sand it had already burrowed into in the larval stage, and the perfect insect from which emerged in June of the following year.

Mr. South exhibited *Noctua castanea*, Esp., and var. *neglecta*, Hüb., and made the following remarks:—

“This insect is described, as you will know, in Stainton’s ‘Manual,’ under Hübner’s name of *neglecta*, as ‘pale grey (with a faint ochreous tinge) or reddish,’ and again under the same name in Newman’s ‘British Moths,’ as varying ‘from ochreous grey to brick-dust red.’

“I show this evening examples of the species from the New Forest and two localities in Perthshire. The New Forest specimens are grey, with an ochreous tinge, and are true *neglecta*. Those from Perthshire, on the other hand, are either grey, with a reddish tinge, or of a decided chesnut colour. The chesnut-coloured specimens are the *castanea* of Esper, and the reddish tinged grey examples connect the two named forms.

“The species occurs on heaths throughout Central and Western Europe, but is more generally represented by the ochreous grey form, *neglecta*. *Castanea* (which, by the way, is Knagg’s *helvetina*) is almost entirely confined to Germany and Britain.

“The larva, which feeds on heather and bilberry, is sometimes brown and sometimes green, but each form is ornamented

with identical markings of a darker colour, and has pale dorsal and sub-dorsal lines. The two larval forms have no correspondence with the two varieties in the perfect state.

“As far as I know the variation of the larva of a species of Lepidoptera is quite independent of variation in the imago. Take *Mamestra persicariæ*, L., for example. I select this species because most of you will have probably bred it. You will know that there are two distinct and constant forms of the larva, one green in colour and the other brown. I never got any but typical *persicariæ* from such larvæ. There is a variety of the imago (*unicolor*, Staudinger) in which the reniform stigma is filled up with brownish instead of white. The South of Turkey is given as a locality for this form, but it may occur elsewhere.

“To return to *Noctua castanea*. I may say that the form *neglecta* is widely distributed throughout Britain, but my knowledge respecting the distribution of *castanea* proper is very limited. I have only received it from Scotland. It is reported to occur in the New Forest, but I have never seen examples from that district.”

Mr. Carrington remarked that during his collecting experience in Scotland, he took a long and interesting series of this species, the chesnut-coloured variety being a little in excess of members of the type, and he noticed, when gathering the larvæ, that they varied somewhat; but he did not think there was any connection with the variation of the larvæ and that of the imago, as he had bred both forms, viz., *neglecta* and *castanea*, from each variety of the larvæ. He had found the larvæ feeding on willow.

FEBRUARY 4th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Chaney exhibited a pretty form of *Hydræcia nictitans*, Bork., and said it was bred from one of two pupæ found by him under a stone on the Saltings at Cliffe, in the county of Kent, July, 1884.

Mr. E. Joy exhibited a sub-diaphanous variety of *Vanessa* *io*, L., from Folkestone, several sub-diaphanous varieties of *V. urticae*, L., and a dwarf form of *Lycæna icarus*, Rott., the coloration of which was somewhat similar to that of *L. corydon*, Fb.

Mr. W. A. Pearce exhibited a North American butterfly, of the genus *Papilio*.

Mr. A. G. Rose exhibited a fine variety of *Epinephele hyperanthus*, L., taken at Box Hill in August last, in which the ocelli on the upper side, instead of being of the ordinary form, were identical with those usually confined to the under side of this species.

Mr. South exhibited short series of *Emmelesia albulata*, Schiff., from the Vaud Canton, Switzerland, and the following counties and districts in Great Britain: Kent, N. Devon, Dumbarton, Rannoch and the Shetland Isles. He said that the Swiss examples represented the form usually found on the Continent, and were the true *albulata* of Schiffermüller. None of the British specimens were exactly identical with those from Switzerland, the principal point of deviation being their smaller size, but in the matter of coloration there was also a notable difference. Although one or two individuals of the Kentish series exhibited a tendency to the ochreous grey colour of Continental specimens, the majority from England and Scotland were decidedly grey, whilst most of those from the Shetland Isles were either drab or brownish grey, with but faint indications of the usual markings. These last were the var. *thules*, Weir; and the grey forms referred to were Staudinger's *griseata*. Mr. South was of opinion that if all the representatives of *E. albulata* in the Shetlands had been of the abnormal colour of a large proportion of the specimens occurring in those isles, they might not have been recognised as pertaining to that species, but as some of the individuals still retained the characteristic markings of *E. albulata*, their specific identity stood revealed. He also referred to a pure

white form of the species (var. *hebudium*, Weir) which is said to occur among specimens of the usual British type in the Isle of Lewis, one of the Hebrides, or Western Islands of Scotland.

In conclusion he said that he held the opinion that a restricted habitat, and the close inter-breeding consequent thereon, had much to do with the production of local forms.

Mr. Rose made some remarks on this species which he had observed in Norway.

Mr. Wellman exhibited a varied series of *Oporabia filigrammaria*, H.-S.

Mr. J. T. Williams exhibited a very beautiful banded variety of *Nyssia hispidaria*, Fb.

Mr. T. R. Billups exhibited *Agapanthia lineaticollis*, Don., from Lincoln; *Callidium variabile*, L., and *Strangalia 4-fasciata*, L., both taken at Chobham, July, 1885, and read the following notes:—

“These three species of Coleoptera belong to the sub-order *Longicornia*, Latreille, this immense family numbering already nearly 4,000 known species, comprising some of the largest, most showy, as well as the most destructive insects of the Insect Fauna. Their eggs are introduced into the cracks in the bark of plants or trees by the long extensive tip of the abdomen. The larvæ are long, flattened, cylindrical, fleshy and often footless whitish grubs, armed with strong sharp mandibles, adapted for boring like an auger in the hardest woods, and live from one to three years in their burrows before transformation; at the end of which time they construct a cocoon of chips at the end of their burrows, the head of the pupa lying next to the thin portion of bark left to conceal the hole.

“*Agapanthia* is often taken on thistles, to the blossom of which it is much attached.

“*Callidium* is mostly met with on old trees, and some-

times fences; while *Strangalia* is met with on umbelliferous flowers and is generally distributed."

Mr. West (Streatham) exhibited a Coleopteron found at one of Messrs. Protheroe & Morris's sales of bulbs. Mr. Billups said it was a beautiful species of the genus *Cionus*, doubtless from Central America, and had probably been packed with the bulbs sent for sale.

FEBRUARY 18th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Tugwell exhibited specimens of the probably new species of *Crambidæ*, together with allied species of the same genus, viz.: *Crambus inquitellus*, Schiff., and *C. contaminellus*, Hb., from Lancashire. Mr. Tugwell said he first took it at Deal in 1877,—he believed the time of appearance was July and August, and he referred to an article by Mr. Tutt in last month's "Entomologist" on this *Crambus*. Mr. Adkin also exhibited an example of this moth, taken in July, 1882, at Deal, and for the purpose of comparison, specimens of *C. inquitellus*, *C. geniculatus*, Haw., and *C. contaminellus*, Hb., from Preston; and said Mr. Tutt had taken the species in question in some numbers at Deal, Mr. Coverdale had found it at Shoeburyness, and it was believed to have been taken at Brandon in Suffolk. It had been suggested that the species was *C. poliellus*, Tr.

Mr. Rose exhibited comparative series of *Bryophila perla*, Fb., from Lea Bridge and Eastbourne; *Boarmia repandata*, L., which he stated to be the typical form found in the Black Woods at Rannoch; and a variety of *Acidalia emarginata*, L., taken at Herne Bay. Mr. Tugwell, referring to this variety, said he did not think it was an unusual form of the species, as he had bred several of a like character. Mr. Carrington said the specimens of *B. repandata* were the Rannoch form of the species, which was quite distinct from any of the southern forms.

Mr. T. W. Hall exhibited series of *Cleoceris viminalis*, Fb., and *Xanthia fulvago*, L., both bred from Derbyshire larvæ. Mr. South remarked that the series of *X. fulvago*, were very fine; one or two of them looked like dark forms of *X. flavago*, Fb., and were probably an instance of hybridism between the two species.

Mr. T. R. Billups exhibited the following Coleoptera, viz.: *Meligethes exilis*, Sturm., from Tenby; *Anthicus schaumii*, Wol., from Weymouth, and *Hydrobius perrisi*, Fair., *Mycetoporus nanus*, Grav., and *Omalium rugulipenne*, Rye, from Hartlepool; also three species from West Africa belonging to the family *Cetoniidæ*: *Ceratorhina morganii*, White, *C. grallii*, Buq., and *C. hornimanii*, Bates.

MARCH 4th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Frohawk exhibited a long and varied series of the imago of *Melitea aurinia*, Rott., coloured drawings of the larva and pupa, and also specimens of an ichneumon bred from the pupæ. Mr. Frohawk said he had received a quantity of the larvæ of this species from Church Stretton, in Shropshire, and had been very successful in rearing large numbers of the imago, the larvæ feeding on honeysuckle. Mr. Billups remarked that the species of ichneumon exhibited was *Apanteles glomeratus*, Gr., and parasitic on a large number of butterflies.

Mr. Tugwell again exhibited specimens of the supposed new *Crambus*, for which Mr. Tutt had suggested the name *cantiellus*. Mr. Tugwell said, that when he last exhibited this moth, he had not seen the Blackheath form of *C. contaminellus*, Hb., but he had since had an opportunity of seeing this form, and felt so convinced that it was the same form as the Deal insect, that he saw Mr. Stainton upon the subject, with the result that there was no doubt the Blackheath *contaminellus* was identical with the new *Crambus*! Herrich-Schäffer, in his

work, figured the Lancashire form of *contaminellus*, both male and female, very minutely under this name; whilst Hübner, under the same name, figured most correctly the Deal insect. Now there was evidently two different representations of either two forms of the same insect, or probably, two distinct insects, both having been named *contaminellus*; and it was certain that the Deal insect had been figured before under this name.

Mr. South suggested that Hübner's name, being the prior one, would have to be adopted for the Deal and Blackheath insect, and the Lancashire insect would consequently be without a name.

Mr. E. Step exhibited a case of birds' eggs, containing thirteen species, taken in the neighbourhood of Leith Hill, among which were the Red-backed Shrike (*Lanius collurio*, L.), the Great Titmouse (*Parus major*, L.), and the Moor Hen (*Gallinula chloropus*, L.)

Mr. A. E. Cook exhibited mounted specimens of the following birds from Hampshire, viz. :—the Kingfisher (*Alcedo ispida*, L.), the Great Spotted Woodpecker (*Picus major*, L.), and the Green Woodpecker (*Gecinus viridis*, L.). From the remarks of several members it was gathered that the Kingfisher was to be seen at, among other places, Blackheath and Lewisham; and both Woodpeckers were commonly to be found at West Wickham and Richmond Park, and not unfrequently in Kensington Gardens.

MARCH 18th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Henderson exhibited *Ichneumon xanthorus*, Foerst., *Lacon murinus*, L., and a species of *Tenthredopsis*, from Lundy Island, off the Coast of Devon.

Mr. T. R. Billups exhibited *Orthoptera* and *Homoptera* from Natal and Borneo, and the following species of *Coleoptera*:—*Onthophagus gazella*, L., *O. marsyas*, L., and *O.* 4-

punctata, L., from Madagascar, and *Anthia sex-guttata*, L., from India. With reference to this last species, Mr. Billups said it belonged to the family of *Carabidæ*, or ground beetles, which delight in arid and sandy soils, in which they form shallow excavations and lie in wait for their prey. In manner and even in the figure of their bodies, they very closely resemble *Broscus cephalotes*, L., which is found so abundantly on the sandy shores of our own coasts. The species appeared to be confined to certain districts of Asia and the African continent, and, although in many parts of the southern shores of Europe the vegetable and animal productions become strongly assimilated to those of Africa, up to the present, we have had no European example recorded.

Mr. R. South exhibited specimens of *Vanessa callirhoë*, Fab., and stated, that this species was closely allied to *V. atalanta*, L., and was found in India, China, Japan, and the Canary Islands. It was especially abundant in the Himalayas, occurring at an elevation of from five thousand to ten thousand feet. It had been introduced into Andalusia and the south of Portugal, and was consequently considered a European insect. The larva fed on the nettle, and, he had been informed, was very similar to that of *V. atalanta*, which species occurred sparingly in the Canaries; but as far as he knew, not in China or Japan. The pair exhibited were bred, among others, by Mr. J. H. Leech, who found the larvæ at Teneriffe, one of the Canary Islands. They were Godhart's *vulcanica*, and differed from eastern specimens in the tone of the red markings. The Indian insect, or *atalanta-indica* of Herbst, has orange-red bands.

Mr. Wellman exhibited dark forms of *Hypsipetes sordidata*, Fb., from Barnsley, and said the larvæ had probably fed on heather.

Mr. A. W. Mera exhibited dwarf forms of *Lycæna ægon*, Schiff., *L. icarus*, Rott., and *Vanessa cardui*, L.

Mr. R. Adkin exhibited reddish forms of *Tæniocampa gracilis*, Fb., which, he said, he understood were bred from

larvæ obtained somewhere in the Kentish marshes, the imago being very different from the ordinary Kentish form. Mr. J. T. Carrington said he had taken this form of *T. gracilis* in the New Forest, but it was really the Rannoch form of the species, and no doubt occurred throughout the whole of Scotland. It was a singular fact that this form should appear in Scotland, where the fauna was to some extent boreal, then miss the whole of the Midlands, and occur in the New Forest, and apparently in Kent; and it would be very interesting to ascertain how the divergence came about.

Mr. E. Joy read notes on collecting Lepidoptera at Wicken Fen, and exhibited specimens of some of the species taken, including *Papilio machaon*, L., *Calamia phragmitidis*, Hb., *Meliana flammea*, Curt., and *Hyria muricata*, Hufn.

APRIL 1st, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. S. Stevens exhibited *Asteroscopus nubeculosa* Esp., which had remained over three years in pupæ.

Mr. South exhibited a fine series of *Hybernia marginaria*, Bork, and the var. *fuscata*, bred from ova received from Mr. Harrison of Barnsley. Mr. South stated the larvæ were fed on hawthorn; the first specimen emerged on the 26th of February and the last on the 22nd of March, the greater number coming out about the 19th of the latter month. Mr. Tugwell also exhibited a series of the same species, together with the var. *fuscata*, and said that they were bred from some of the same batch of ova as those exhibited by Mr. South.

Mr. Billups exhibited the following Coleoptera; *Panagæus quadripustulatus*, Sturm., and *Lebia chlorocephala*, Hoff., taken in Headley Lane on the 22nd March, 1886. Also two species of Diptera: *Sciaria pulicaria*, Hoff., and *Trichocera regelationis*, L., bred from apples.

Mr. Billups also exhibited a living specimen of the Viviparous or Scaly Lizard (*Zootoca vivipara*, L.), and said

it was the smaller and more graceful of the two species of lizard found in Great Britain. It was common in this country, and chiefly found in dry sunny banks, thickets and copses. It was not so abundant on the Continent, but was found in France, Italy, Germany, and Switzerland, frequenting the pine woods in the latter country. Its motions were singularly varied and agile, and it darted on its insect prey with the velocity of an arrow, its sight as well as its hearing being most acute. The only other species in this country was known as the Sand Lizard (*Lacerta agilis*, L.)

Mr. Billups also called attention to a branch of the Stinking Hellebore (*Helleborus fœtidus*, L.), which he had found growing the previous week in Headley Lane, Surrey, and he remarked that it belonged to the order *Ranunculacæ*, or Crow Foot Family, and was known in many places as the Bear's-foot, Ox-heel, or Setter-wort. The plants of this order were distributed over the whole surface of the globe, and were all of them more or less poisonous, but the Hellebore appeared to possess the most powerfully poisonous properties of the whole family. The only other species found in this country was the green Hellebore (*H. viridis*, L.).

Mr. J. A. Cooper exhibited eggs of the following British birds: the Sparrow Hawk (*Accipiter nisus*, L.), the Water Hen (*Gallinula chloropus*, L.), and the Coot (*Fulica atra*, L.)

Mr. W. West, of Streatham, contributed a paper on "The Entozoa or Internal Parasites."

Mr. West began his paper by referring to the ancient records of the *Entozoa*, or internal animal parasites, and then passed on to the classification of the species.

The class Entozoa or Helmintha is divided into three sub-classes, viz., the *Sterelmintha*, *Cœlelmintha*, and *Anenterelmintha*, which are again divided into five orders, viz., *Turbellaria*, *Trematoda*, *Nematoda*, *Acanthocephala*, and *Cestoda*. These orders are further divided into nineteen families, and

there are seven others that have apparently no settled place, and are called particular types.

The first order, the *Turbellaria*, are recognized by vibratile cilia covering their bodies, which are composed of soft tissue, and are of various forms : some flattened, pear-shaped, others cylindrical, of enormous length, and jointed somewhat like tapeworms ; they are capable of increase by the usual sexual methods and by fission.

The second order, the *Trematoda*, or Flukes, have soft roundish or flat bodies enveloping the visceral organs. They are small animals, the smallest being about one-hundredth part of an inch, and the largest varying from one to five inches in length. They undergo several metamorphoses, the earlier of which take place in ponds, or ditches, and damp pasture-grounds.

The common liver fluke (*Fasciola* or *Distoma hepatica*) gives rise to a disease called "the rot," in sheep ; it is oviparous, and the action of water loosens the lid-like covering that the egg is provided with, and sets free a little wedge-shaped embryo covered with cilia. After a short active life it alters its form, and takes up its abode in some mollusc, where it becomes transformed into a cyst, and afterwards develops into a tadpole-like animal called a *Cercaria*, which, if swallowed by cattle, make their way to the liver, and after a time become converted into sexually mature *Trematoda*. Again they get restless, make their way to the intestinal canal, and eventually become expelled with the fæces.

Mr. West then went on to describe the anatomy of one of the *Distomidæ* which infest man ; and called attention to one of the particular types, *Bilharzia*, which at first sight has the appearance of a round worm or leech. This resemblance is due to the edges being rolled inwards, forming a tube, as it were, in which the female is generally found embraced. She is a small filamentous-looking body, not nearly so large as the male. *Bilharzia* are found mostly in Egypt, and give rise to many serious complaints.

The third order, the *Nematoda*, or round worms, are of

various sizes, the smallest types are represented by the so-called vinegar and paste eels, whilst others have been seen several feet in length. About 550 species have been described in the eight families. About the best known is called *Trichocephalus dispar*, which belongs to the fourth family, the *Filaridæ*. The anatomy of this worm was minutely described, as also that of the well-known *Nematoid* worm, the *Trichina spiralis*, the cysts of which, when introduced into the stomach of an animal, attain their sexual maturity in about forty-eight hours, and the viviparous females become parents in about six days. The young then penetrate through and take up their abode in the voluntary muscles, where they become encysted, and remain coiled up within them, waiting to become devoured by some other animal. If not released, after a time they break up, and become transformed into carbonate of lime. Leuchart found in one ounce of muscle 325,000 individuals of this species.

The fourth order, the *Acanthocephala*, contains no types infesting man, although they have been found in mammals; birds and fishes are most troubled with them. They are small animals, having elongated bodies, marked by transverse folds. At the head is a long mouth or proboscis, armed with recurved hooks, and in the male there is a peculiar clasping organ to assist it in the sexual act. The embryo is a pear-shaped organism, and develops *within its own* interior a small *Echinorhynchus*: the original body becomes part of the new development, and only the old skin is cast off. When transferred to the body of another host it becomes sexually mature in about a week.

The *Cestoda*, the fifth order, comprises the so-called tapeworms, which are distinguished by their soft, flat, long bodies, divided into joints, the anterior of which forms the head and neck. The head, which is exceedingly small when compared with the length of the animal, is furnished with four suckers, and sometimes a double crown of hooks. The joints at the posterior end are capable of existing independently and of developing ova. *Cestoda* are found either in the larval or

mature condition in almost all animals, but mostly in the Carnivora. Man harbours no less than ten species.

If the mature joints or proglottides are administered to an animal, in twenty-four hours minute embryos are found in the blood, and are carried along to the liver, where they form a colony of cysts. After a time they escape by pushing their way through, take up their abode in other parts of the body, and undergo a second encystation, which takes place in about eight weeks. If these cysts are administered to some other animal, the larva is set free in two or three hours, and in three days shows indications of becoming jointed; in twelve days they are four inches long, and become sexually mature in about a month. The *Proglottides* are furnished with male and female organs of generation, but are not capable of self-impregnation, as was formerly supposed.

Mr. West then minutely described the anatomy and life-history of the most common one infesting man, the *Tænia solium*, and stated that they had been found 10 ft. 2 in. in length, and containing 825 segments. He also described the *Tænia echinococcus*, which causes one-seventh of the annual mortality of Iceland.

The *Tetrarhynchidæ* infest the marine vertebrata. Having described the life-history of this worm, Mr. West concluded by a few words of advice how to avoid becoming infested with Entozoa. The remedy is very simple; partake of no animal food but what is thoroughly cooked, nor any vegetables that have not been thoroughly washed or boiled. Butchers through their ignorance frequently infect themselves; they place the knife between their teeth that has been used to cut up a diseased animal, the ova thus get transferred to their stomachs.

The paper was well illustrated by diagrams and specimens of the various Entozoa under microscopes.

APRIL 15th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. A. W. Mera exhibited *Syntomis phegea*, L., bred from ova deposited by a female captured in Italy.

Mr. Wellman exhibited *Phoxopteryx upupana*, Tr.

Mr. Billups exhibited a curious construction which had been found by Mr. J. T. Williams under a stone in his garden at Foot's Cray. The formation consisted of about thirty or forty fusiform cocoons composed of a felt-like material, and arranged side by side, vertically and transversely, the whole forming a pear-shaped mass; each cocoon contained a larva which Mr. Billups said was certainly not Dipterous, nor Hymenopterous, but might probably be the larva of a species of Lepidoptera.

Several members concurred in this opinion.

Mr. A. E. Cook exhibited *Moloch horridus*, Gray, a species of *Agamidæ* from South Australia, and a living specimen of the Green Snake, *Natrix torquata*, Ray, taken at Sevenoaks.

MAY 6th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. G. Elisha exhibited a bred series of *Antispila pfeifferella*, Hb. Sta., with specimens of the mined leaves and the pupæ cases cut out from the same, and said there was a statement by Mr. C. Healy in one of the early volumes of the "Entomologist" (Vol. II., p. 129) that the larvæ pupated under the surface of the earth. Now he (Mr. Elisha) had bred a large number of the insects, and he found they invariably took their cases in between the decaying leaves, and not under the surface of the earth, as stated by Mr. Healy.

Mr. Wellman exhibited *Adela cuprella*, Thnb. Sta., from Wimbledon Common.

Mr. R. Adkin exhibited a series of *Endromis versicolor*, L., bred from larvæ reared in 1884; and he mentioned that from these larvæ nine moths emerged in 1885; one male and eight females; whereas the twelve that appeared this year were all males.

Mr. Step exhibited a specimen of *Morchella esculenta*,

Pers., found by Mr. B. W. Adkin at Wantage, Berkshire; and said it was not by any means a common fungus in this country, most of those that were eaten in England being brought from the Continent.

Mr. Carrington remarked that he once found two specimens of this fungus at Box Hill, Surrey.

Mr. Carrington stated that during the Easter recess he had paid a visit to Selborne, the home of Gilbert White, and what was most noticeable was the backwardness of the season. The only lepidoptera seen were hibernated specimens of *Vanessa io* and *V. urticae*, and examples of *Pieris napi* and *Diurnia fagella*; and for four days' good work in a district which, under natural circumstances was one of the best localities in which to spend an entomological holiday, he thought this was a most meagre list. He mentioned that a bitch otter with two young were noticed in the neighbourhood of Selborne.

MAY 20th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. D. A. Cockerell exhibited a cluster of cocoons of a species of Ichneumonidæ from Constantinople.

Mr. J. Jäger exhibited *Aleucis pictaria*, Curt, and other Lepidoptera from the New Forest.

Mr. R. Adkin exhibited white males of *Spilosoma mendica*, Clerck, from the south of Ireland, about which he stated he hoped to say something at a future time.

Mr. Levett exhibited a bred series of *Ligdia adustata*, Schiff., from larvæ beaten in the neighbourhood of Shooter's Hill.

JUNE 3rd, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Tugwell exhibited some interesting forms of *Spilosoma menthrasti*, Esp., bred from ova received from Hartlepool.

Also a specimen of *Anosia plexippus*, L., taken on the 21st September, 1885, at Trevilly, by Mr. Harris Saundry.

Mr. W. G. Sheldon exhibited *Eupithecia pusillata*, Fb., and *Retinia turionana*, Hb., both from West Wickham, Kent.

Mr. Wellman exhibited living larvæ of *Eugonia autumnaria*, Wernb., *Acidalia emarginata*, L., and *Epione apiciaria*, Schiff.

Mr. W. West (Streatham) exhibited preserved larvæ of *Eubolia cervinaria*, Schiff., and *Xanthia citrigo*, L.

Mr. G. P. Shearwood exhibited a number of preserved larvæ, the various stages of several species being shown; among the species exhibited were *Phorodesma smaragdaria*, Fb., and *Aciptilia galactodactyla*, Hb., the latter taken on the Society's excursion to Horsley, Surrey, on 29th May last.

Mr. R. Adkin exhibited four specimens of *Saturnia pavonia*, L., bred from a nest of gregarious larvæ taken 21st June, 1884, at Chattenden, Kent, and found feeding on hazel; and which had fed up on hornbeam, remaining in pupæ until the present year; the colours of the imagines being particularly rich and bright.

Mr. T. R. Billups exhibited specimens of *Paussus favieri*, Fairm., found in nests of the ant, *Pheidole megacephala*, var. *pallidula*, F., by Mr. Lewis, in Portugal.

This gentleman also exhibited *Meteorus luridus*, Ruthe., bred by Mr. Bignell of Plymouth, from the larva of *Noctua brunnea*, Fb., twenty-three parasites emerging from one host. The only previously known specimen was a male in the collection of Mr. Bridgman, Norwich, the host being unknown.

JUNE 17th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited the following Ichneumonidæ: *Apanteles bicolor*, Ns., bred from *Lithocolletis lantanella*, Schr. Stn. *Colastes braconius*, Hall., bred from *L. spinicollis*, Kol. *Limneria interrupta*, Gr., bred from *Sericoris euphorbiana*,

Frr. These three species were bred by Mr. Elisha. *Mesoleius sanguinicollis*, Gr., and *Pimpla brevicornis*, Gr., both bred from *Gracillaria stigmatella*, Fb., Stn., by Mr. Wellman. Mr. Billups also exhibited two species of Tenthredinidæ, viz., *Allantus viennesis*, Schr., and *Hylotoma cærulipennis*, Rtz., taken in copula at Hayling Island on the 7th June.

Mr. W. G. Sheldon exhibited a varied series of *Hepialus lupulinus*, L., taken at Riddlesdown, Surrey; also bred series of *Earias chlorana*, L., and *Crambus chrysonuchellus*, Scop.

Mr. Frohawk exhibited *Acontia luctuosa*, Esp., from Cudham.

Mr. W. A. Pearce exhibited a bred series of *Cucullia verbasci*, L., the larvæ having been taken at Mickleham, Surrey.

Mr. Jäger and Mr. J. T. Williams both exhibited *Erastia venustula*, Hb., from Horsham, Sussex; and the latter gentleman also exhibited *Acronycta alni*, L., and *Aphomia sociella*, Hb., bred from the cluster of fusiform cocoons found under a stone by him in his garden at Foot's Cray, a portion of which had been exhibited by Mr. Billups at the meeting on the 15th April last.

Mr. T. R. Billups exhibited large groups of the larvæ of *Hyponomeuta padellus*, L. Sta., which he said he had received from Gravesend, and he understood that an enormous amount of damage had been caused, both in Kent and Oxfordshire, by the ravages of this larva; the apple trees in these two counties being literally stripped of both the young fruit and leaves. In some parts of Oxford the owners of the orchards had adopted the plan of spreading sheets under the trees and beating the larvæ into them; but the difficulty was that in beating the larvæ off, the young fruit fell at the same time.

Some discussion then took place as to the probable cause of the appearance of this larva in such large numbers, and the best means to be adopted to exterminate them, in which Messrs. Adkin, Tugwell, Wellman, Chaney, J. T. Williams, West, and others took part.

Mr. W. West (Greenwich), exhibited a long series of a species of Coleoptera, belonging to the genus *Buprestidia*, taken at Suakim.

Mr. Step exhibited living specimens of the edible snail, *Helix pomatia*, L., from Ranmore, Surrey.

JULY 1st, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. South exhibited a specimen of *Melanippe fluctuata*, L., of a cream colour, the markings being reduced to almost vanishing point; this variety was taken on a fence in the neighbourhood of St. John's Wood.

Mr. Wellman exhibited *Thecla rubi*, L., and called attention to the absence of the white spots from the under-side of one specimen; a long series of *Eupithecia rectangulata*, L., comprising a light grey variety and several specimens of the var. *nigrosericeata*, Haw.; and a long series of *Aciptilia galactodactyla*, Hb., from larvæ taken at Horsley, Surrey.

Mr. Sheldon exhibited *Dianthæcia nana*, Rott., from Deal, and *Phoxopteryx derasana*, Hb., from Riddlesdown, Croydon.

Mr. T. R. Billups exhibited two living larvæ of *Boarmia repandata*, L., received from Mr. South, and which showed a curious arrangement of the cocoons of a species of Microgaster; Mr. South stated the larvæ spun a little pad of silk, then bent themselves into a bow on the twig, and the parasites began to creep out of the host and formed their cocoons under the arch.

Mr. Sheldon exhibited an egg of the cuckoo (*Cuculus canorus*, L.), found by him at Shirley Heath, Surrey, on the 26th June last, in the nest of a Meadow Pipit (*Anthus pratensis*, L.).

Mr. W. A. Pearce exhibited a coloured drawing of the Fly Orchis (*Ophrys muscifera*, Huds.), taken at Ranmore, on the occasion of the Society's excursion to Bookham.

JULY 15th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited specimens of *Cleptes nitidula*, Latr., taken at Benfleet, in Essex, on the 5th inst., on the umbelliferous bloom of the Common Cow Parsnip (*Heracleum sphondylium*, L.), and which he stated was probably the rarest of the twenty-two species comprising the family Chrysididæ. It had been taken in the New Forest and in Suffolk. Mr. Smith states that he once took a specimen near Lowestoft, and received one from Loch Rannoch. It will thus be seen it is a very local species, the male especially so, the specimen exhibited being the only male recorded as taken in this country.

This gentleman also exhibited the larvæ of *Geometra papilionaria*, L., and its parasite, *Apanteles rubripes*, Hal., and said it had been bred by Mr. Curtis and Mr. Bignell, commonly from the same larvæ; Mr. Harding had also reared it from *Vanessa urticæ*, L., and Mr. Cameron from *Pieris brassicæ*, L.

Mr. Jäger exhibited *Dianthæcia nana*, Rott., bred from larvæ obtained at Caterham, Surrey, and Teignmouth, Devon; those from the first-named locality feeding on *Silene inflata*, Sm., and those from Teignmouth feeding on *Silene maritima*, With.; *Dianthæcia cucubali*, Fues., reared on *S. inflata*; and bred specimens of *Botys terrealis*, Tr.; also several species of *Eupithecia*, bred from various flower-heads which had been kept in leno bags—a plan suggested by Mr. Carrington.

Mr. Gaskell exhibited a variety of *Ematurga atomaria*, L., of an almost uniform fulvous tint with only slight indications of the normal markings visible towards the hind margin. The specimen was taken at West Wickham, Kent.

Mr. J. T. Williams exhibited a specimen of *Cabera pusaria*, L., irradiated with black; a curious form of *C. exanthemata*, Scop., *Dasycera olivierella*, Fb., from Foot's Cray, Kent, and

a striking variety of *Abraxas grossulariata*, L. (Pl. I, fig. 2) bred from larva obtained in Mr. Hicklin's garden at Sidcup, Kent. The ground colour of this specimen was a full rich cream inclining to buff, the anterior wings having the usual basal blotch of orange with two black spots, not so large and distinct as in ordinary specimens. The orange median band was also very slightly dotted with black on either side, terminating on the costal margin with a more distinct blotch; the outer margin having six small but vivid black spots within the cilia; the posterior wings of the same ground colour, with a few minute black specks along the anal and outer margins, and none whatever in the median area.

Mr. T. Gibb, Junr., *Asthena blomeri*, Curt., *Hepialus velleda*, Hb., var. *carnus*, St., and a variety of *Melanippe montanata*, Bork., all taken in the neighbourhood of Burton-on-Trent.

Mr. R. South exhibited specimens of *Boarmia repandata*, L., bred from larvæ obtained this year from North Devonshire. He remarked that although several curious forms of this species had occurred to him in former years, the series (89 in number) bred this year, was by far the most interesting he had yet had an opportunity of studying, embracing as it did a greater range of variation and comprising some extraordinary examples of the *conversaria* form, together with numerous varieties of the typical form.

The specimens exhibited were selected with the view of showing the extremes in each phase of variation. In two examples of the *conversaria* form the ground colour was almost of the same dark shade as the central band; whilst two other specimens of the same form had respectively a pure white and creamy white ground colour, with exceedingly rich velvety black central bands.

Two of the specimens exhibited are figured Pl. I, Figs. 3 and 4.

Mr. South also exhibited a long series of *Aphomia sociella*, L., and with reference thereto stated that some of the specimens shown were bred from the portion of the cluster of cocoons found by Mr. Williams in his garden at Foot's Cray, which was exhibited at the meeting on the 15th April last; while the others were bred from a bundle of sticks from Dartford, so closely spun together by the larvæ that it required some force to separate them (the bundle of sticks was exhibited). He was of opinion that the cluster of cocoons found by Mr. Williams was the natural mode of pupation of the species; and the pupation among the sticks, a modification of this natural habit induced by the nature of the material the larva had to deal with in confinement. From the bundle of sticks he had bred ninety-six specimens, while from the small piece of the cluster found by Mr. Williams (which he also exhibited), he had bred twenty-one; and there were probably many more to emerge, as one had come out on his way to the meeting.

Several members contributed remarks on this species.

Mr. R. Adkin exhibited living larvæ of *Notodonta trepida*, Esp., reared from ova deposited by a female of this species taken on May 22nd, 1886, at rest on an oak trunk at Seal Chart, Kent.

The Secretary read a letter from Mr. Perkins of Wotton-under-Edge recording the probable capture by his nephew, of *Sesia andreniformis*, Lasp., at that place.

With reference to this insect, Mr. Carrington said it was one of the rarest of the British *Sesiidæ*. He had heard that in Germany it had been taken very freely by searching the flowers of the privet in July, and he determined to try and take it in the same way in England. He accordingly went to one of its old localities, near Gravesend, and searched for about an hour the only time the sun was visible, and during that period he saw one which he unfortunately failed to capture. He had very little doubt that

if the blossom of the privet was properly searched during the first fortnight in July, *S. andreniformis* would be taken.

AUGUST 5th, 1886.

J. JENNER WEIR, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. T. R. Billups exhibited male and female specimens of *Cleptes nitidula*, Latr. (Pl. I, fig. 11), and read the following notes:—

“Shuckard in his very excellent monograph on the *Chrysididæ*, published in the ‘Entomological Magazine’ in the year 1836, speaking of the male of *Cleptes nitidula* says, ‘I can detect no difference between the insect I possess as the male of this species, and the male of the preceding, *C. semiauratus*, with the exception of the slighter exertion of the fifth abdominal segment, and the colour of the head and thorax being more blue.’ The late Frederick Smith, in his short but concise monograph, published some twenty-five years later—in the ‘Entomologist’s Annual’ for the year 1861—says, ‘the male I do not know.’ As Shuckard gives no other peculiarity or difference between the two species, I have taken some little trouble to search, but can find no other written or published description. This being so, it has led me to carefully examine a large number of the males of *C. semiauratus*, but structurally I can find no difference between the two species. As regards colour—which is not always a safe test—there is most certainly a distinct difference, and I am compelled to differ from both Messrs. Shuckard and Smith’s descriptions. They say of *C. semiauratus*, head, thorax, and basal joints of the antennæ bright metallic green, as also the coxæ and femora; while of the abdomen, Smith says, the apical margins of the third, fourth and fifth segments black. Shuckard says, the abdomen shining testaceous, with the marginal half of the third segment black, and the fourth and fifth of a steely-blue. From a large number of specimens of *C. semiauratus* examined by myself, the head, thorax and basal joint of the antennæ, as well as the coxæ and femora, are

a bright metallic blue, with, in some cases, a very faint approach to green; while the abdomen is shining testaceous, with the basal half of the third segment black, and the fourth and fifth metallic blue or violet.

"In the male of *Cleptes nitidula*, the colour of the basal joint of the antennæ, head, thorax and femora is a bright golden green; while the first and second segments of the abdomen are obscure and also testaceous, the third, fourth, and fifth deep black, with no approach of a chalybeous reflection.

"These few observations I think clearly prove that Shuckard had certainly not the male of *C. nitidula* to describe from, while Mr. Smith's description would almost lead one to suppose—unless he had a number of specimens under observation—that instead of describing the male *C. semiauratus*, he was actually describing the rarer of the two species, viz., *C. nitidula*."

Mr. Billups then called attention to four groups of Cocoons, from which he had reared a large number of *Microgaster flavipes*, Hall., and stated that this species of Braconidæ was parasitic in the larvæ of *Boarmia repandata*, from which it had been repeatedly bred by Kriechbaumer and Brischke on the Continent, and by Bignell and Cooper in this country. The whole of the *Microgasteridæ* were internal parasites, living in the body of a single victim larger than themselves, and in the case of some of the smaller species, issue in great numbers from the same caterpillar, forming their cocoons in clusters like a honeycomb, their heads, however, not being all turned the same way, the imago making its exit from both sides of the so-called honeycomb, which is always fixed up on edge. The following numbers which emerged from the cocoons exhibited, will give some idea of the fecundity of these parasites, 82, 66, 67, and 57, a total of 272 specimens from four larvæ of *Boarmia*, added to which there were in each cluster of cocoons a large number which perished, not being able to release themselves.

This gentleman also exhibited *Chrysis succincta*, L., taken at Chobham, Surrey, July 28th, 1886, on the bloom of the wild carrot (*Daucus carota*, L.), and stated that this rare species of the Chrysididæ was only recorded as having been taken some fifty years since by Messrs. Dale and Rudd, in Hampshire, and the late Mr. F. Smith had only met with it twice, and then in the same county.

Mr. W. West (Streatham) exhibited *Eugonia autumnaria*, Wernb., and bred specimens of *Ocneria dispar*, L.

A short discussion took place as to this last species not having been taken in England in the wild state for the last thirty years. Mr. Chaney stated that he took a female in a wood near Chatham about thirty years ago, and a friend (Mr. Walker), took a male at Chattenden about fifteen years ago.

Mr. Wellman exhibited three very fine specimens of *Dianthæcia albimacula*, Bork., from Folkestone ; series of *Epione parallellaria*, Schiff., and *E. apiciaria*, Schiff., both having been bred from ova.

With reference to the second of these insects (*E. parallellaria*), Mr. Weir said that he understood it was likely to become almost extinct in this country, as the place where it was now found would probably be destroyed ; and he referred to the burning by the Government of the herbage of the locality where *Zygæna meliloti*, Esp., used to occur, and the consequent almost total destruction of the species.

Mr. Carrington stated that as an old captor of this insect he should like to mention two or three facts as to its probable extinction, which he did not think was immediately possible. The best ground for the insect was a small piece of land covered with heather, detached from the common, and might be ploughed up at any time ; but the land was so poor, and so unlikely to be worth the trouble of breaking up, that it was not probable the locality would be destroyed. The insect, however, also appeared on a large tract of common land of four or five acres in extent. The best time in which

to take imagines in numbers was about seven o'clock in the morning, when the ground was wet with dew; after half-past nine the imago was only to be obtained by being kicked out. The larvæ fed on *Salix repens*, L., and both he and Mr. Prest had made many attempts to introduce the species to other localities, but without success.

Mr. Goldthwaite exhibited *Ematurga atomaria*, L., among which was a singular variety of the male; the ground colour of all wings being a bright orange, the usual transverse brown bands absent, but replaced on the forewings by several black blotches, so placed as to give the insect a very distinct and beautiful appearance. Also a xanthic variety of *Lycæna minima*, Fues., from West Horsley; and a long series of very dark forms of *Xylophasia monoglypha*, Hufn., which he stated was almost the only result of twelve days work in that locality.

Mr. C. Oldham exhibited a series of *Abraxas grossulariata*, L., bred from pupæ obtained from Cambridgeshire, showing a better range of variation than is usually seen in a number bred in the same hap-hazard way.

Mr. Carrington said that in the north of England, where varieties are more frequent than in the south, the collectors never hunted promiscuously, but went to particular localities where there was almost a certainty of getting those beautiful banded varieties that were to be found in the north, and it was extremely probable that these varieties were hereditary. Dark forms were more likely to be obtained when the larvæ were fed on blackthorn. There was a melanic variety of the larva taken in the neighbourhood of Shields, and as far as he knew was never taken elsewhere. The usual food plants of the larva were blackthorn, currant, and gooseberry, but it was not to be found so commonly on gooseberry as on currant. The larva had, however, been found feeding on *Cotyledon umbilicus*.

Mr. Weir remarked that the fact of this species feeding on the *Cotyledon* was very interesting, as it was a plant closely allied to the currant and gooseberry.

Mr. W. A. Pearce exhibited *Calligenia miniata*, Forst., from the New Forest.

Mr. J. Jenner Weir exhibited five beautiful varieties of *Argynnis paphia*, L., and said that after many years' experience, they were five of the most marked he had seen. All the specimens were females, one being the lightest he had ever taken, another as dark as the variety *valezina*, Esp., and was a melanic variety of *paphia*, properly so-called; also a perfect form of *valezina*, and a beautiful green form of the same variety.

Mr. J. H. Carpenter exhibited a larva of *Hepialus virescens*, from Tikitapu Bush, near Rotorua, New Zealand, with the fungus known as *Cordiceps robertsii*, growing from the neck of the larva.

Mr. W. A. Pearce exhibited a specimen of the Horned Toad (*Ceratophrys cornuta*, L.), from California.

Dr. C. M. Matthews, exhibited the flowers of what are known as the Green Dahlia and Green Rose.

Mr. E. Step exhibited *Planorbis albus* v. *draparnaldi*, Shepp., and *Zonites crystallinus*, Mull., from Moulsey Hurst.

AUGUST 19th, 1886.

J. JENNER WEIR, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. W. G. Sheldon, exhibited bred series of *Eupithecia pimpinellata*, Hb., *Conchylis dilucidana*, St., *Grapholitha geminana*, St., *Ephippiphora cirsiana*, Zell., bred from thistle stems, *E. fænella*, L., and some interesting forms of *Xanthosetia zægana*, L., from Hackney Marshes.

Mr. J. J. Weir, exhibited several xanthic varieties of *Erebia epiphron*, Knock., *Epinephele ianira*, L., *Satyrus semele*, L., *Cænonympha pamphilus*, L., and a very pale form of *Polyommatus phlæas*, L.

Mr. J. A. Cooper exhibited a long series of *Argyrolepia badiana*, Hb., and said that both Mr. Stainton and Mr. Merrin gave the larvæ of this species as feeding in the stems

and roots of Burdock (*Arctium lappa*, L.) ; but he had searched carefully, and had been unable to find any larvæ either in the stems or roots, although he had found them plentifully in the seed heads of the plant, from which those now exhibited were bred.

Mr. Cooper also exhibited *Phorodesma smaragdaria*, Fb., bred from larvæ found in the Essex Salt Marshes. The larvæ being figured on Pl. I. fig. 5.

Mr. Jobson exhibited *P. smaragdaria* bred from larvæ found in the same locality; *Erastria venustula*, Hb., bred from ova, and *Lobophora sexalisata*, Hb.

Mr. J. T. Williams exhibited an almost albino variety of *Acidalia bisetata*, Hufn., and a variety of *Larentia olivata*, Bork. (Pl. I. fig. 1), having the whole of the base of the wings suffused as far as the median fascia.

Mr. Helps exhibited *Boarmia repandata*, L. var. *conversaria*, Hb., from the New Forest.

Mr. C. Oldham exhibited examples of the second brood of *Lycæna argiolus*, L., and ova of the same species laid on a twig of holly.

Mr. Frohawk exhibited *Timandra amataria*, L., bred from ova laid on the 7th July last, and coloured drawings of the larva and pupa.

Mr. Goldthwaite exhibited black forms of *Eupithecia rectangulata*, L.

Mr. W. A. Pearce exhibited a coloured drawing of *Hadena pisi*, L., and food plant.

Mr. Step exhibited growing specimens of the Round-leaved Sundew (*Drosera rotundifolia*, L.), and the Long-leaved Sundew (*D. intermedia*, Hayne), from Chobham.

SEPTEMBER 2nd, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited a rare species of Hymenoptera: *Tachytes unicolor*, Panz., taken at Hayling Island, on June 7th, 1886.

Mr. J. R. Wellman exhibited a box of Exotic Lepidoptera, which, he stated, had all been taken at sea ; also living larvæ of *Cidaria picata*, Hb., and *Acidalia rusticata*, Fb.

Mr. W. G. Sheldon exhibited red and grey forms of *Noctua castanea*, Esp., bred from larvæ taken on Shirley Heath, Surrey.

Mr. Adkin stated he had frequently obtained larvæ of this insect from Shirley, but had never bred the red form of the species.

Mr. South exhibited varieties of *Lycæna corydon*, Fb., taken at Eastbourne, and he stated he had taken thirty-five specimens, which were all connecting links right up to the extreme forms he now exhibited ; and he was of opinion that the real interest attaching to varieties was to show the links connecting extreme forms with types, rather than having the extreme forms only.

Mr. J. J. Weir said he quite agreed that it was necessary in arranging insects in the Cabinet, to graduate them, the extreme forms, and then the links connecting them with the type. It was a most singular thing that more varieties of *L. corydon* were taken this year by Mr. South than he (Mr. Weir) had taken in his life, although he had captured great numbers of the species at Lewes.

Mr. South also exhibited *Abraxas grossulariata*, L., and said that these again, as in *corydon*, were the extreme forms, but out of a large number bred this year he had all the connecting links between the ordinary and extreme forms. None of those he exhibited were very striking varieties, but they were just in that stage, that in a few more years, if bred from, some very striking varieties would be obtained. He wished it to be understood that he fully believed in varieties being perpetuated.

Mr. South further showed specimens of *Dicrorampha consortana*, var. *distinctana*, Hein., and remarked that, in 1881, he captured two specimens in North Devon, one of which

was sent to Mr. C. G. Barrett, who identified it as *distinctana* of Hein., only taken before at Vienna, until taken by him (Mr. South) in North Devon; and he thought that last year Mr. Machin had taken two specimens of a *Dicro-rampa*, which Mr. Barrett had also identified as *distinctana* of Hein.

This year, Mr. South added, he had bred fourteen specimens of *distinctana* from shoots of *Chrysanthemum* received from North Devon; and he had no doubt whatever it was a form of *consortana*, the reason being that the larva was identical with the description of larvæ of *consortana* he took some years ago at Shanklin, Isle of White, and the habits of both larvæ were also exactly similar.

Mr. J. J. Weir exhibited seven specimens of *Argynnis paphia*, L., and one specimen of *A. euphrosyne*, L., and drew attention to the white spots on the wings, which, he said, were not suffused spots, as seen in *Epinephele ianira*. It was a very curious thing that these spots should be so conspicuous. He had this year taken seven examples, and heard of several others having been captured. What could be the origin of these spots? Possibly the pupa had something on it which prevented the rays of light from colouring the insect; in nearly all cases the spots were symmetrical.

Mr. South said that in 1881 or 1882 he took some specimens of this insect with the spots, and it occurred to him at the time that they were probably caused by the sun's rays passing through a globule of water and falling on the pupa. In some cases the spots were symmetrical, in other cases anything but so; but, as a rule, they were not symmetrical. Mr. Carrington observed it was scarcely possible one drop of water would cause these spots, as the angle of light would be such as to concentrate the rays, and would leave a line instead of a distinct spot. He remembered one particular season, in the New Forest, when a great many were taken, some showing the spots in the centre of the wing, and in various other ways. It was not probable all these pupæ

were lying in the same locality. So far as he could gather, they were taken considerable distances apart, and he thought we ought to look elsewhere for the causes of these spots. He then referred to the cases of *A. betularia*, L., and *T. crepuscularia*, Hb., in which the variation has become permanent in certain localities. Several other members continued the discussion, and Mr. Adkin exhibited *Cleocerus viminalis*, Fb., a species which he stated had some little bearing on the question of permanent variation. From twelve larvæ sent him from Barnsley, he expected to rear only the black form of the species obtained in that locality; but among them he had bred one of the ordinary form of the species as found in the south of England. Mr. South said he had received forms of this species from Glasgow quite as dark as those from Barnsley. Mr. Sheldon contributed observations on collecting *T. crepuscularia*, in Derbyshire, from which, it appeared, that in some of the woods which had been thinned, the insect was generally found on the trunks of oak trees, and was the light form, whereas those found in another wood which was very thick, were very dark, and, in some cases, almost black.

Mr. J. A. Cooper exhibited *Axylia putris*, L., *Zonosoma orbicularia*, Hb., *Eupithecia subfulvata*, Haw., and *Tephrosia biundularia*, Bork., the latter bred from a female captured in June last, the larva having fed upon knot-grass.

Mr. T. R. Billups exhibited the following Coleoptera:—*Choragus sheppardi*, Kirb., from Broadstairs; *Trox sabulosus*, L., from Chobham; the delicate little longicorn *Molorchus minimus*, Scop., and *Mycetoporus longulus*, Mann., taken at Bookham, on the Society's excursion, June 26th; and the scarce *Panagæus quadripustulatus*, Sturm. Two local species of Hemiptera—*Phylus coryli*, L., and *P. avellanæ*, H. S., taken at the Society's excursion to Westerham, in July last, the immature form of *Temnostethus pusillus*, Schiff., *Microphysa elegantula*, Baer., from Broadstairs, and also the Homopteron *Ledra aurita*, L., from the same locality.

Mr. Billups read a note from Mr. Bignell, of Plymouth, in reference to some remarks made by him before the Society July 1st, concerning the larva of *Boarmia repandata* and its parasite, *Microgaster flavipes*, Hal.

Mr. South said it appeared to him that Mr. Bignell took especial exception to the statement that the larva of *B. repandata* "spun a little pad of silk." Probably Mr. Bignell thought that the silk on which the *Microgaster* formed their cocoons was referred to, in which case his contention would be valid, as it was certain that although the larva of *repandata* seems to be exceedingly attentive to its parasites, it does not carry its attention to the extent of providing a foundation for the erection of the pyramid of cocoons formed by those parasites immediately under its body. The object of the silken pad is evidently to enable the lepidopterous host to effect a secure hold with its anal claspers during the time it is bent in arch-like form, not only whilst the *Microgaster* larvæ are leaving its body, but for some considerable time after the parasites have housed themselves under the sheltering protection of its curved form.

SEPTEMBER 16th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. J. A Cooper exhibited a long series of *Zygæna filipendulæ*, L., showing marked variations of the border of the posterior wings, from North Devon.

Mr. Adkin exhibited *Lophopteryx cuculla*, Esp.

Mr. E. Joy exhibited a remarkable variety of *Epinephele ianira*, L.

Mr. Wellman exhibited series of *Acidalia bisetata*, Hufn., with very pronounced marginal markings, from Raindean Wood, Folkestone; long varied series of *Bryophila muralis*, Forst., from southern localities, and a specimen of *B. impar*, Warren, from Cambridge. Also *Dianthæcia irregularis*, Hufn.

Mr. W. G. Sheldon exhibited *Triphosa dubitata*, L., and *Agrotis agathina*, Dup., both taken at the flowers of heather on Shirley Heath, Surrey. Some discussion ensued as to rearing the larvæ of the latter species.

Mr. J. J. Weir exhibited a specimen of *Agrotis*, taken forty years since, which has not yet been identified; also a specimen showing some of the characteristics of both *Agrotis segetum*, Schiff., and *A. suffusa*, Hb.

Mr. W. West (Greenwich), a long and variable series of *Cryptocephalus pusillus*, Fab., from West Wickham, Kent.

OCTOBER 7th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Billups exhibited *Echthrus lancifer*, Gr., (plate 1, fig. 8), a species of *Ichneumonidæ* new to Britain, taken by him at Walmer in August last, and said that the genus appeared to be very rare, or at least, very little known in this country—hitherto being only represented by one species, *E. reluctator*, L.; they appeared to be parasitic on wood-boring larvæ. Herr Brischke had bred members of the genus from *Sesia sphagiiformis*, *S. formiciformis*, and *Leucania obsoleta*; and no doubt if Lepidopterists, who bred the clear-wing moths, were to save the parasites which appeared in their cages, species of *Echthrus* would be found among them.

Mr. Wellman exhibited examples of second broods of *Melanippe tristata*, L., *Acidalia emarginata*, L., *A. rusticata*, Fb., and *A. strigilaria*, Hb., all reared from ova. It was remarked that a second brood of *A. strigilaria* was somewhat unusual.

Mr. J. Jäger exhibited specimens of *Callimorpha hera*, L., taken in the south of Devon, one the var. *lutescens*, Staud., having been taken by a signalman at Teignmouth. Also a number of forms of *Bryophila muralis*, Forst., from Dawlish, among which were some of a brownish coloration, and he stated that he found more of this form than any other.

Mr. J. T. Williams exhibited *Eupithecia linariata*, Fb., bred from larvæ taken in July, which were full fed and out within about fourteen days.

Mr. R. South exhibited yellow-banded forms of *Sesia culiciformis*, L., also *Mimæseoptilus zophodactylus*, Dup., and *M. bipunctidactyla*, Haw.

Referring to these plume-moths, Mr. South said that *Mimæseoptilus zophodactylus* is a smaller and more slender-looking insect than *M. bipunctidactyla*, but these characters are not in themselves sufficient to distinguish one species from the other. A more trustworthy feature is the white costal edging to the outer digit of fore-wing of *zophodactylus*.

Mr. South also exhibited series of *Thera variata*, Schiff., from Switzerland, England, and Scotland, and stated that the specimens from Switzerland were the true *variata*, and differed in colour from *obeliscata*, the form found in this country, and which, in his opinion, was the only form obtained here. The Scotch form, known as *obliterata*, was described by Dr. Buchanan White, and was a small and dark variety of *obeliscata*. A specimen of *Thera juniperata*, L., was also exhibited for comparison, as the coloration and character of the markings of *variata* were more nearly allied to *juniperata* than *obeliscata*.

Mr. Elisha exhibited *Agrotis ashworthii*, Dbl., and *Dasycampa rubiginea*, Fb.

Mr. R. Adkin exhibited the following species of Lepidoptera taken in East Sussex during the past season: Varieties of the undersides of *Lycæna icarus*, Rott., very closely approaching the variety *icarinus* of Scriba; and of *L. corydon*, Fb., *Lithosia griseola*, Hb., *Bryophila perla*, Fb., including an orange variety; *Stenia punctalis*, Schiff., *Amblyptilia acanthodactyla*, Hb., and *Diasemia literata*, Scop. With reference to this last species, Mr. Adkin stated that although occasionally met with in our southern counties, it appeared to be of by no means common occurrence. It was mentioned by Westwood as having been

taken in moist places in Darenth Wood and the New Forest. Stainton, in his "Manual of British Butterflies and Moths," gives Lyndhurst, Newnham, and Sanderstead as localities. Several specimens were taken by Mr. Norcombe in Devonshire, in 1858, and a little later Mr. Reading captured about twenty-four near Plymouth; but Mr. C. G. Barrett reports it in some numbers from Pembrokeshire, and gives the date of its appearance as the first half of the months of June and August; and he subsequently mentions that after losing sight of it for ten years, he took about a score in 1881, and seventeen in 1884.

Morris figures this species (Pl. 54, No. 19); but the notes given under this number evidently refer to *Nascia ciliialis*, Hb., figured under No. 17 on the same plate; and if we assume that the figures have been transposed, as appears probable, we find that he adds Plymouth and Arundel to the above list.

Mr. J. J. Weir exhibited a variety of *Vanessa cardui*, L., from Grahamstown, South Africa, with a row of white spots on the primary and secondary wings, the latter having the nervures thickly edged with black, widening into blotches on the hind margin, and he stated that a similar variety was sometimes taken in England. A white and black specimen of *Colias electra*, from the same locality, showing that that species exhibited a similar dimorphic condition of the female to that which obtains in *Colias edusa*, Fb.; two specimens of *Lycæna corydon*, Fb., from Lewes, the fringes of all the wings of one being spotless white, and of the other inky grey. Mr. Weir then made a communication to the Society to the effect that Mr. F. F. Freeman, of Plymouth, had informed him that he had just seen a specimen of *Anosia plexippus*, L., taken by Miss Whipple at Donderry, on the southern coast of Cornwall. Adverting to a note of Mr. G. D. Hulst, "Entomologica Americana," ii. 104, August, 1886, in which it was stated that the name of this insect as given above is that which the British Museum gives to what the rest of the Lepidoptero-

logical world calls *Danaïs archippus*, Mr. Weir remarked that the genus *Anosia* was established by Hübner in 1816, and this insect placed in it under the name of *menippe*; but Linnæus, in 1758, had named the species *plexippus*, and it was not till 1793 that Fabricius named it *archippus*. All this is shown in Mr. Moore's admirable monograph of *Linnaïna* and *Euplœina* in the proceedings of the Zoological Society, 1883, pp. 233-34. It was true that the name *plexippus* was erroneously applied to *Salatura genutia*, Cram. (1779), an Indian species, by several authors. Linnæus describes his species as American; but little attention was paid in his time to the geographical distribution of animals, and some of his followers misapplied the description. At all events, both the generic name *Anosia*, and the specific name *plexippus*, were long ago applied to this insect, the latter indeed for more than a century and a quarter.

Mr. E. Sabine exhibited a variety of *Papilio machaon*, L., which was especially noticeable on account of the attenuated character of the band on the hind wings. Also a number of varieties of *Zygæna filipendulæ*, L., taken in Kent, including several of the yellow form.

This gentleman also exhibited varieties of *Lycæna bellargus*, Rott., the specimens exhibited including a number of light forms and two black males. Mr. Sabine gave an account of how he took this extraordinary number of varieties, and said that they represented examples of both the spring and autumnal broods, and with the exception of one of the black males (which was captured in a previous year) were all taken during the present season. They were all found on a chalky soil; and he was of opinion that they were hybrids between *bellargus* and *corydon*, as on one occasion at the same locality, he took a male of *bellargus* in copula with a female of *corydon*.

Mr. Weir remarked with regard to these varieties that he thought the light specimens must be hybrids between the two species mentioned by Mr. Sabine, but the curious part of the

whole matter was that they had been taken both in the spring and autumn. As to the black males, which were taken in different years, he could only say that in the course of his experience, during which he had paid a great amount of attention to this species, he had never seen or heard of anything like it.

Mr. South, who stated he had also paid considerable attention to *L. bellargus*, concurred with Mr. Weir in his observations on Mr. Sabine's exhibit.

Mr. West, of Greenwich, exhibited two species of *Coleoptera* from Shirley, Surrey—*Balaninus rubidus*, Gyll., and *Erirhinus pectoralis*, Panz.,—the former taken on birch, and the latter on sallow.

Mr. T. R. Billups exhibited a species of Hydradephaga, *Colymbetes fuscus*, L., from which a Lepidopteron, most probably *Endrosis fenestrella*, Scop., had emerged; the pupa case being firmly attached to the body of the beetle.

Referring to this exhibit Mr. Billups said no doubt the egg had been laid between the elytra, and after its emergence the larva made its way into the body of the beetle, where its metamorphosis took place, finally making its exit from between the hinder part of the elytra, which had been gnawed away to allow of the escape of the imago.

This gentleman also exhibited specimens of the very pretty and curious Birds'-nest fungus (*Cyathus vernicosus*), found growing in his garden at Peckham.

OCTOBER 21st, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited the following species of Ichneumonidæ; *Trogus lutorius*, Fab., and its rare ally, *T. alboguttatus*, Gr. (Pl. I, fig. 7), the former bred from *Chærocampa porcellus*, and the latter from *Sphinx ligustri*. Mr. Billups stated that both species had been bred by Mr. R. Adkin from larvæ taken at Dartford, Kent, and that this

genus of Ichneumonidæ contains nearly our largest species, being only eclipsed by the genus *Rhyssa*. It seems somewhat remarkable that both these species, which, until just lately, were the only recorded species in Marshall's List of British Hymenoptera, should be bred from larvæ taken in the same locality. The third species, *Trogus exaltatorius*, Panz., was described by Mr. Bridgman in a paper read before the Fellows of the Entomological Society of London, July 7th, 1886, from a specimen given to him by Mr. G. E. Bignell, of Plymouth.

Mr. Billups also exhibited a fine series of *Apanteles jucundus*, Marsh (Pl. 1, Fig. 12), both sexes being represented, as well as the cluster of cocoons from which they emerged. These little *Microgasterides* were bred from the larvæ of *Pieris brassicæ*, L., received by Mr. South from Ireland. This exhibit was especially interesting from the fact that there is no record of the insect having been reared previously, and in describing it last year, the Rev. T. A. Marshall, in his Monograph of the British *Braconidæ*, had but one specimen to work from, that being a female, taken by sweeping in Northamptonshire, the male being then unknown.

Mr. C. H. Watson exhibited *Acherontia atropos*, L., (bred) and *Catocala sponsa*, L., and *C. promissa*, Esp., from the New Forest.

Mr. Levett also exhibited *A. atropos*, taken on a fence in the neighbourhood of Greenwich.

Mr. E. Joy exhibited *Cidaria sagittata*, Fb., bred from larvæ taken in Wicken Fen, Cambridge.

Mr. Helps exhibited *Lasiocampa quercifolia*, L.

Mr. W. West (Streatham) exhibited two xanthic forms of *Bryophila perla*, Fb., from Margate.

Mr. W. G. Sheldon exhibited *Plusia chryson*, Esp., *P. festuæ*, *P. pulchrina*, Haw., *Amblyptilia acanthodactyla*, Hb., and *Tortrix ribeana*, Hb.

Mr. Ficklin exhibited a long series of *Pædisca sordidana*, Hb.

Mr. J. Jäger exhibited a specimen of *Sphinx convolvuli*, L., taken at Starcross, South Devon.

Mr. L. Gibb, a specimen of *Argynnis aglaia*, L., taken at an elevation of 2800 feet above the level of the sea; varieties of *Lycæna icarus*, Rott., and other species from Scotland; also a long series of *Zygæna exulans*, Hoch., var. *subochracea*, White, from Braemar; and for the purpose of comparison, two examples of the Swiss form of this insect.

Mr. Tugwell also exhibited this species from the same locality, and an empty pupa case, made up among Crowberry, (Pl. 1, Fig. 6). He stated that the only difference between the Swiss form and the variety *subochracea* of White was that in the Swiss specimens the red was very much deeper in colour, and the scales were more dense.

Mr. Mera exhibited bred examples of *Eugonia autumnaria*, Wernb.

Mr. G. Elisha exhibited *Dianthæcia irregularis*, Hufn., bred by him this season.

Mr. Wellman exhibited a number of species, taken or bred by him during the season, among which were *Cidaria picata*, Hb., *C. silaceata*, Hb., and several *Acidalia*.

Mr. Shearwood exhibited preserved larvæ of a great many species including *Toxocampa pastinum*, Tr., *Stilbia anomala*, Haw., *Lithosia mesomella*, L., *Melanippe hastata*, L., *Abraxas grossulariata*, L., including the black variety, *Nyssia zonaria*, Schiff., *Cucullia chamomillæ*, Schiff., *C. absinthii*, L., *Nola albulalis*, Hb., *Deilephila galii*, Schiff., and *Asteroscopus nubiculosa*, Esp.

Mr. R. Adkin exhibited a bred series of *Acidalia inornata*, Haw., in reference to which he said there was a doubt in the minds of many as to distinguishing it from *A. aversata*, L. but he was of opinion that the spots in the fringes of the first-

mentioned species afforded a trustworthy distinction if the specimens were in anything like order.

Mr. Adkin also exhibited, on behalf of Mr. William Farren, of Cambridge, long series of *Bryophila muralis*, Forst., *B. impar*, Warren, and *B. perla*, Fb.—the first-mentioned from Folkestone, and the last two from Cambridge. Mr. Adkin stated that there had been some considerable discussion as to whether *impar* was a true species, or only a variety of *muralis*. He was pleased to have the opportunity of bringing Mr. Farren's exhibit to the notice of the meeting, and he would like to have the opinion of the members present upon this point. For the purpose of comparison with this exhibit, Mr. Wellman had brought his beautiful series of *muralis*, and Mr. Jäger the red forms of the same species, taken by him this year at Dawlish, and which had been already exhibited at one of the Society's meetings. Mr. Farren had asked him to call attention to the neater, harder, and more glossy look of *impar*, compared with *muralis*, and to the fact that the latter was generally larger; also that the reniform stigma, which extended almost across the fore wings, was filled up, and almost obliterated with black in *impar*, while at the anal angle was a blackish blotch always present in *impar*, but absent in *muralis*. The lines in *impar* instead of ending in spots on the costa, ran together, and formed a blackish edging along the costa; further, the wings in *impar* were not so ample as in *muralis*, and the fore wings were decidedly narrower than in that species. Although both varied considerably in colour, running from grey to a deep bluish green, the whole tone of colour was very different in the two—*impar*, both on body and wings, being peppered with black, and *muralis* with pale greyish brown.

Mr. Weir said the *Bryophila* was not a group to which he had paid very much attention; but looking at the habits of the whole genus, and the necessity for their resembling walls and old rocks, and at the light in different neighbourhoods, he could quite understand that local forms and races were almost

sure to arise, and it would be impossible to suppose otherwise. In the present state of the question, he felt disposed to say that *impar* was not a clear species, but it should be bred from the larvæ before we could speak with certainty. It appeared to him that it was only a dominant variety of the particular district in which Mr. Farren had taken the insect.

Mr. Tugwell said he quite endorsed what Mr. Weir had said, and that, in his opinion, it was simply a local form of *muralis*, and nothing more.

Mr. Wellman concurred in this view, as did several other members.

Mr. Carrington said he had never heard of any of the genus *Bryophila* having been reared from ova. He was of opinion that if ova were obtained it would not be such a difficult matter to rear the larva as was generally supposed; and if reared, it would no doubt clear up the disputed point.

Mr. Oldham made a communication to the effect that the Long Pond, in the Warren at Folkestone, had been destroyed by the erosion of the coast by the sea; and he exhibited a fossil of *Pecten beevori*, in a fine state of preservation, partially covered with iron pyrites.

NOVEMBER 4th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Billups exhibited seven male specimens of *Halictus xanthopus*, Kirby, a species of Hymenoptera-Aculeata, from Reigate, Surrey; and he stated that the whole seven were taken on one solitary bloom of thistle. The species was very local and appeared to prefer situations on the coast. It was occasionally plentiful at Hastings, Ventnor, Arundel, Littlehampton, Southend, and Deal, but had not been recorded so far inland as Reigate, nor taken later than the month of August. The date of the capture of those exhibited was the 30th October, and was probably without precedent, and only

to be accounted for by the mild and spring-like weather of the last two months.

Mr. West (Streatham) exhibited bred specimens of *Eubolia cervinata*, Schiff.

Mr. Wellman exhibited *Dasydia obfuscaria*, Hb., and *Eupithecia togata*, Hb.

Mr. A. E. Cook exhibited *Vanessa c-album*, L., from Wales.

Mr. Jäger exhibited a striking variety of *Hypsipetes ruberata*, Fr., taken at Brockenhurst, in the New Forest.

Mr. Carrington stated that this variety was not uncommon in Scotland, in which country there was only one brood, whilst in England there were two.

Mr. W. G. Sheldon exhibited dark forms of *Hypsipetes sordidata*, Fb., from Cadder Moss, Lanarkshire.

Mr. T. W. Hall exhibited short series of *Cerastis vaccinii*, L., and *C. spadicea*, Hb., which, he remarked, were exhibited not for their rarity, but rather to get an expression of opinion as to whether the two species were distinct or whether *spadicea* was but a somewhat uncommon variety of *vaccinii*. The specimens shown were chiefly from Epping Forest.

Mr. Adkin said it was one of those questions which Entomologists looked at from different points of view.

Mr. R. South exhibited *Gnophos obscuraria*, Hb., and read the following notes:—

“There are forms of *obscuraria* which run so close to varieties of other European species of *Gnophos*, that it is hardly matter for surprise that authors should have included such insects as *pullata* and *dilucidaria* in works on British Lepidoptera.

“As far as we know at present *obscuraria*, Hb., is the only species of the genus found in Great Britain. At the same time it is quite possible that the *pullata* of Hüb. is not really distinct from his *obscuraria*. The descriptions of the

larvæ of these insects are, in some respects, not quite identical but the insects themselves are very similar. Again, the variation of *pullata*, like that of *obscuraria*, ranges from a white or whitish form on the one hand, to a black or blackish form on the other.

“*Dilucidaria*, Hb., has a certain superficial resemblance to the paler form of *obscuraria*, but on a closer examination the structural differences of the two insects are at once apparent.

“By way of illustrating the variable character of *obscuraria*, in the ground colour of its wings more especially, I exhibit specimens from widely distant British localities. The first three are from Folkestone, and these in tone of colour lead up to the darker coloration of the New Forest and Perthshire specimens in the next row. The third and fourth rows are from North Devon and Lewes respectively.

“From these examples it will be seen that in each locality the species is represented by a different form, and each form seems fairly constant in its particular locality. The Folkestone, New Forest, and Perthshire specimens are more or less typical. The North Devon examples come near to, but are not quite, Staudinger’s var. *argillacearia*, and the Lewes insects approach the var. *calceata*, Staud.

“Mr. Jenner Weir, in an elaborate paper on ‘Variations in the colour of Lepidoptera,’ ‘Entom.’ xvi. 169–176, says (p. 173), ‘as an instance of a topomorphic variety, dependent, apparently, on the geological environment, I know of no better example than that of *Gnophos obscuraria*.’ With regard to the forms before you this evening it would be difficult to imagine coloration more suitable for each in its peculiar habitat than that which it possesses.

“In the production of these varied forms there is, I think, no question of food influence. The differences between the darkest and lightest specimens is simply one of more or less blackish pigment, and the amount of such pigment is regulated by the laws of natural selection and in-

heritance working in accord with the surroundings of the insect."

Mr. Rose exhibited *Lycæna virgaureæ*, L., from Norway; varieties of *Boarmia repandata*, L., from the Isle of Wight and Ambleside; and *Nudaria mundana*, L., which latter species had been plentiful on walls in the Lake District.

Mr. Adkin exhibited specimens of *Euchelia jacobææ*, L. in one of which the red markings were absent from the right wing.

Mr. Chaney exhibited the following species of Coleoptera: *Sphodrus leucoptthalmus*, L., from Peckham; *Molytes germanus*, L., *Agabus nitidus*, F., from Snowdon; and *Barynotus mærens*, F., from West Horsley.

Mr. T. R. Billups exhibited the scarce grasshopper, *Gomphoceros rufus*, Ch., from Reigate; a new locality for this species of Orthoptera; also the following species of Hemiptera:—*Corimelæna scarabæoides*, L., and *Sehirus morio*, L., both from Reigate. Mr. Billups stated that neither had hitherto been recorded from this locality, Messrs. Saunders, Douglas, and Scott giving London districts only for *S. morio*; and Purley Downs, Gloucester, Mickleham, and the sand hills near Burnham, for *C. scarabæoides*.

Mr. Billups also exhibited three distinct groups of miniature cocoons produced from larvæ mining the leaves of a plant of Columbine (*Aquilegia vulgaris*), growing in his garden at Peckham, and which, he stated, were most probably dipterous, or some species of Chalcid parasitic on the miner.

Mr. Billups then called attention to a note in the current number of "Science Gossip," recording the occurrence of a large flight of butterflies at Salzburg, Austria; and a short discussion took place as to this and similar flights which have been noticed from time to time, in which Messrs. Carrington, South, Williams, Adkin, and others, took part.

NOVEMBER 18th, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited a female specimen of *Prosopis punctulatissima*, Sm., taken at South Hayling, June, 1886, and said that this very rare short-tongued bee had hitherto only been recorded from Birch Wood, Kent, where it was taken some twenty-five years since by the late Mr. F. Smith.

Mr. Billups also exhibited two drawers of *Ichneumonidæ*, containing types of most of the genus from the *Ichneumonides* to the *Cryptides*; also large series of most of the *Chrysididæ*, showing his improved system of mounting these very fragile insects, and his new mode of labelling, obviating the necessity of keeping a journal.

Mr. R. Adkin exhibited *Ptilophora plumigera*, Esp.

Mr. R. South exhibited three instances of parallelism in the coloration of the female of *Lycæna icarus*, Rott., and *L. bellargus*, Rott., two being well-marked examples of their respective types, and one being a variety of *L. bellargus*, coming close to var. *ceronus*, Esper., but lacking the orange spots on the forewings. If these had been present it would have exactly corresponded with the variety of *icarus* exhibited by its side. There was also shown a curious form of the male of *Lycæna corydon*, Fb., with distinct ocelli on the forewings, and a specimen of *L. icarus* from the Isle of Hoy, having a strong tinge of the *bellargus* blue on the inferior wings.

Mr. W. G. Sheldon exhibited a specimen of the genus *Xanthia* which, Mr. South stated, was known in this country as var. *ocellaris* of *Xanthia gilvago*, Esp., and probably identical with *Xanthia ocellaris*, Bork.

Some discussion ensued, in which Messrs. South, Adkin, Carrington, Sheldon, and Williams, took part.

Mr. E. Step exhibited two species of fungi from Wimbledon Common: *Calocera viscosa* and *Peziza aurantia*.

DECEMBER 2nd, 1886.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Tutt exhibited, and drew attention to the close resemblance of, several species and forms of *Agrotis*. The exhibit comprised a number of *A. nigricans*, L., from Deal, Greenwich, and Cuxton; about 500 specimens of *A. tritici*, L., and var. *aquilina*, Hb., from several localities, and so-called Scotch *obelisca*, with specimens of *obelisca*, Hb., from Germany for comparison; also specimens of *agathina*, Dup., from Perthshire, and a very fine series of *cursoria*, Bork., from Sligo, among which were many interesting forms, some of them very like German *obelisca*. One peculiar specimen, among other curious forms of *tritici*, from Sligo, lent Mr. P. Russ, bore a superficial resemblance to *agathina*.

Mr. Tutt also exhibited, on behalf of Mr. Russ, *Epunda lutulenta*, var. *sedii*, Gn., together with a beautiful example of the var. *luneburgensis*, Frr., captured near Sligo.

Mr. Adye exhibited a melanic variety of *Hemerophila abruptaria*, Thnb., and a curious male variety of *Epinephele ianira*, L., having a conspicuous white blotch of irregular shape upon each of its four wings.

Mr. R. South exhibited a number of Rhopalocera, from the Amor Valley, Siberia. Among the species were *Lycæna cleobis*, Brem., *L. argiades*, Pall., *L. optilete*, Knock., *L. zephyrus*, Friv., *Argynnis selene*, Schiff., *A. selenis*, Ev., and *A. euphrosyne*, L.

Mr. R. Adkin exhibited *Cidaria reticulata*, Fb., bred during the present season by Mr. H. Murray, Carnforth, from larvæ found on *Impatiens noli-me-tangere*, L., near Windermere.

Mr. W. A. Pearce exhibited a coloured drawing of the larva of *Mamestra persicariæ*, L., feeding on willow.

Mr. Tugwell exhibited a number of insects from New Caledonia. Among these was a specimen of *Chærocampa celerio*, L., which he stated was exactly similar to the type found in this country. There were also in the box several species of *Syntomis*, allied to *S. phegea*.

Dr. P. Rendall exhibited a specimen of *Noctua festiva*, Hb., v. *conflua*, Tr., taken by him at sugar, in the New Forest, between the 20th and 28th July. He stated that during this time he took not a single specimen of the ordinary form of *festiva*, although this had been common about the 17th to 20th June. An interesting discussion then took place as to whether *conflua* was distinct from *festiva*.

Mr. Hall exhibited a specimen of the large green grasshopper, *Locusta viridissima*, taken at sugar. Mr. Tugwell said, that on the sandhills at Deal it was a very common experience, in the course of an evening's sugaring, to find this species, and he was of opinion that they came there to catch the moths that were attracted by such sugar, and he had frequently seen them attack and make a meal of even so large an insect as *Phlogophora meticulosa*, L. Mr. Billups said that this species of grasshopper was not at all particular as to its food. He had kept them alive by feeding them with small pieces of beefsteak or worms.

Mr. Billups exhibited a species of Coccidæ (or Plant Lice), *Aleurodes vaporariorum*, Westw., taken from a greenhouse at Snarebrook, Essex, December 2nd, on the leaves of Tomato (*Lycopersicum esculentum*), where it had been doing an immense amount of damage to the plant, and read the following note:—

“This species was first described and figured by Prof. Westwood in the ‘Gardener’s Chronicle,’ 1856, page 182; but for a later description I would refer Members to the ‘Entomologists’ Monthly Magazine’ for this month, page 165, where the insect is more fully described by Mr. J. W. Douglas, to whom I am indebted for identification.”

Mr. R. South read a paper on British snake-like reptiles.

The author having briefly referred to Professor Huxley's division of the Zoological sub-kingdom Vertebrata into three primary sections, viz.: Ichthyopsida, Sauropsida, and Mammalia, made some remarks on the apparently incongruous grouping together of reptiles and birds in the section Sauropsida. He then proceeded to deal with the class Reptilia, and observed that of the four orders in this class represented by living forms in the present day, only two, viz.: the Ophidia and Lacertilia had representatives in Britain.

The three British Ophidians, and one snake-like Lacertilian were then discussed at some length.

DECEMBER 16th, 1886.

R. ADKIN, Esq. F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited three species of Ichneumonidæ, new to Britain :—

Bassus bizonarius, Gr. (Pl. 1., Fig. 13), taken in his garden at Peckham, May, 1885.

Erromenus (*Trichocalymma*, Foerst.) *plebejum*, Wolds (Pl. 1, fig. 10), taken at Dulwich, June 11th, 1885.

Perilissus triangulatus, Bridgm. (Pl. 1, fig. 9). The male was taken in his garden at Peckham, May, 1885, and the female at Croxted Lane, Dulwich, May, 1885. He stated that he was indebted to his friend, Mr. J. B. Bridgman for the identification of these three new species, which he has fully described in a paper read before the Entomological Society of London, July 7th, 1886, and printed in full in the Society's Transactions for 1886.

Mr. Dobson exhibited wasps' nests of the genus *Odynerus*, found under a doorway in the New Forest.

Mr. Adye exhibited specimens of *Sphinx convolvuli*, L., taken at Christchurch, 1885 ; and he stated that although he had been out on upwards of forty nights, he had not seen a single example of the species this year.

Mr. Adkin, on behalf of Mrs. Hutchinson, exhibited a male specimen of *Stauropus fagi*, L., having female antennæ.

Mr. West, of Streatham, exhibited eggs of the Emu (*Dromaius novæ hollandiæ*).

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Members will greatly oblige by informing the *Hon. Sec.* of any errors or alterations in the above addresses and descriptions.

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THE SOUTH LONDON Entomological & Natural History Society

(Established 1872)

The Bridge House, London Bridge, S.E.



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To whom all Communications should be addressed.

1887
125617

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,

THE BRIDGE HOUSE, LONDON BRIDGE, S.E.

The Society has for its object the diffusion of Biological Science, by means of papers, and discussions, and the formation of typical Collections. There is a Library for the use of Members. Meetings of the Members are held on the 2nd and 4th Thursday evenings in each month, from Eight to Ten p.m., at the above address. The Society's rooms are easy of access from all parts of London, and the Council cordially invite the co-operation of all naturalists, especially those who are willing to further the objects of the Society by reading papers and exhibiting their specimens.

SUBSCRIPTION.

*Seven Shillings and Sixpence per Annum, with an Entrance
Fee of Two Shillings and Sixpence.*

All communications to be addressed to the Hon. Secretary,

H. W. BARKER,

83, Brayard's Road, Peckham, S.E.

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1876 ... „	1884 ... W. WEST, L.D.S.
1877 ... J. P. BARRETT.	1885 ... R. SOUTH, F.E.S.
1878 ... J. T. WILLIAMS.	1886 ... R. ADKIN, F.E.S.
1879 ... R. STANDEN, F.E.S.	1887 ... „

REPORT, 1887.

THE Council have again to congratulate the Members in this, their sixteenth Annual Report, on the continued prosperity of the Society, the year now fast drawing towards a close having been a most successful one. At the end of 1886 it was found necessary, for many reasons, to remove the headquarters of the Society to more suitable premises. The present rooms were then taken at a slight increase in the yearly rent; and as a result of the greater convenience and comfort, together with other causes, the Council can again report a large increase in the membership. When the last Report was issued, the number of Members on the books was 106; during the year 51 new Members have been elected, we have lost one Member by death, one has resigned, and the names of seven others have been erased from the books, leaving a total of 148 Members.

Owing to the increased membership, the exhibits have been more varied and numerous, a greater number of papers have been read, and, as a consequence of this, the average attendance of Members at the meetings has been better than it had been for some time past.

The financial position of the Society still continues satisfactory, as will be seen on reference to the Balance Sheet.

The following is a list of the additions to the Library:—

“The Entomologist” for 1887, and “The Zoologist,” for 1887.

From Mr. T. P. NEWMAN.

“The Entomologist’s Monthly Magazine” for 1887. From Mr. MCLACHLAN.

“The Young Naturalist.” From Mr. J. E. ROBSON.

“The Charter, Bye Laws and List of Fellows.” From the ENTOMOLOGICAL SOCIETY.

"Thirty-six hours' hunting among the Lepidoptera and Hymenoptera of Middlesex." From Mr. S. T. KLEIN.

A Scrap Book for Press Reports. From Mr. E. STEP.

"List of Macro-Lepidoptera of East Sussex," "A Revision of genus Entomobrya," "Macro-Lepidoptera of Killarney," "Lepidoptera of Bristol District," "Science Monthly," 3 Parts of "The Hoosier Naturalist," "Notes from my Aquarium" (G. Brook), "Report of Observations of Injurious Insects" (Ormerod), Vol. I. of "The Naturalist" (1887), "Dragon Flies, Ants, etc" (Bath), a map of Rannoch on rollers, various papers, magazines, etc. From Mr. JOHN T. CARRINGTON.

"List of Macro-Lepidoptera of East Sussex." From Mr. J. H. JENNER.

"Genera of British Mosses" (Unwin), and "List of Macro-Lepidoptera of East Sussex." From J. JENNER WEIR.

Part II. of "Transactions of the Essex Field Club," and "The Essex Naturalist," for 1887. From The ESSEX FIELD CLUB.

"Manual of the Mollusca" (Woodward). From Mr. H. L. BOLGER.

Six Copies of Paper on "Pedigree Moth Breeding." From Mr. F. MERRIFIELD.

"Report of Agricultural and Horticultural Society of India." From Mr. W. H. MILES.

"Animal Parasites" (Van Beneden); "Ants, Bees, and Wasps" (Sir John Lubbock); and "The Garner" for 1887. From Mr. T. R. BILLUPS.

"The Naturalist's Monthly." From Dr. WILLIAMS.

"Our Summer Migrants" (Harting). From Mr. FENN.

"Abstract of Proceedings of the Metropolitan Scientific Association." From the ASSOCIATION.

Plate for Society's Proceedings. From Mr. F. W. FROHAWK.

“Year Book of Scientific and Learned Societies;” “Science Gossip” for 1887; Vol. II. of Buckler’s “Larvæ of British Lepidoptera.” BY PURCHASE.

The Council take this opportunity of again thanking the respective donors to the Library; and at the same time they wish to express their thanks to Mr. Chaney for his services as Librarian, and the general feeling of regret that he finds himself unable longer to fulfil the duties of that office.

The following donations have been received for the Society’s collections, which are still under the care of Mr. W. WEST, of Greenwich:—

A pair of *Zygæna exulans*, from Mr. L. GIBB.

A number of species of Lepidoptera from Mr. R. ADKIN and Mr. R. SOUTH.

British Land and Freshwater shells from Dr. RENDALL.

Many species of Lepidoptera, Hymenoptera, Coleoptera, etc., collected in the neighbourhood of Colorado, from Mr. T. D. A. COCKERELL.

The following Excursions have been held:—

The Zoological Society’s Gardens on May 14th.
Conducted by Mr. J. JENNER WEIR.

Loughton on June 4th.
Conducted by Mr. C. OLDHAM.

Mickleham on June 25th.
Conducted by Messrs. STEP, C. A. BRIGGS, and T. H. BRIGGS.

Sevenoaks on July 16th.
Conducted by Mr. J. T. WILLIAMS.

The Annual Exhibition was held on the 16th of November, there being about 100 Exhibitors, and despite the exceedingly foggy weather, an attendance of about 1,000 visitors.

H. W. BARKER,

Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL

BALANCE SHEET FOR

GENERAL

RECEIPTS.

	£	s.	d.
To Balance from last Audit, Dec. 16th, 1886	9	5	9
„ Subscriptions and Entrance Fees	39	16	0

£49 1 9

PUBLICATION

To Balance from last Audit	...	...	...	1	5	0
„ Transfer from General Fund	...	...	...	12	0	0
„ Sale of "Proceedings"	...	...	...	2	0	0
„ Donations	...	...	...	2	18	0

£18 3 0

LIBRARY

To Balance from last Audit	...	...	...	1	7	8
„ Library Fines	...	...	...	0	17	2

£2 4 10

ASSETS.

To Balance, General Fund...	...	7	0	2½
„ „ Publication „	...	1	6	0
„ „ Library „	...	1	2	4

Total Cash Balance	...	9	8	6½
„ Estimated Realisable Proportion of Arrears	...	2	10	0

£11 18 6½

Audited and found correct,

AND NATURAL HISTORY SOCIETY.

THE YEAR 1887.

FUND.

EXPENDITURE.

	£	s.	d.
By Rent	10	18	0
„ Transfer to Publication Fund	12	0	0
„ Purchase of Books	1	10	0
„ Postage and Stationery	5	11	9½
„ Exhibition Expenses (part only)	9	3	4
„ Printing	2	9	6
„ Sundries	0	8	11
„ Cash Balance in hand	7	0	2½
	<u>£49</u>	<u>1</u>	<u>9</u>

FUND.

By Printing	16	17	0
„ Cash Balance in hand	1	6	0
	<u>£18</u>	<u>3</u>	<u>0</u>

FUND.

By Binding	1	2	6
„ Balance in hand	1	2	4
	<u>£2</u>	<u>4</u>	<u>10</u>

LIABILITIES.

By Rent due Christmas, 1887	3	3	0
„ Balance of Assets over Liabilities	8	15	6½

£11 18 6½

December 22nd, 1887.

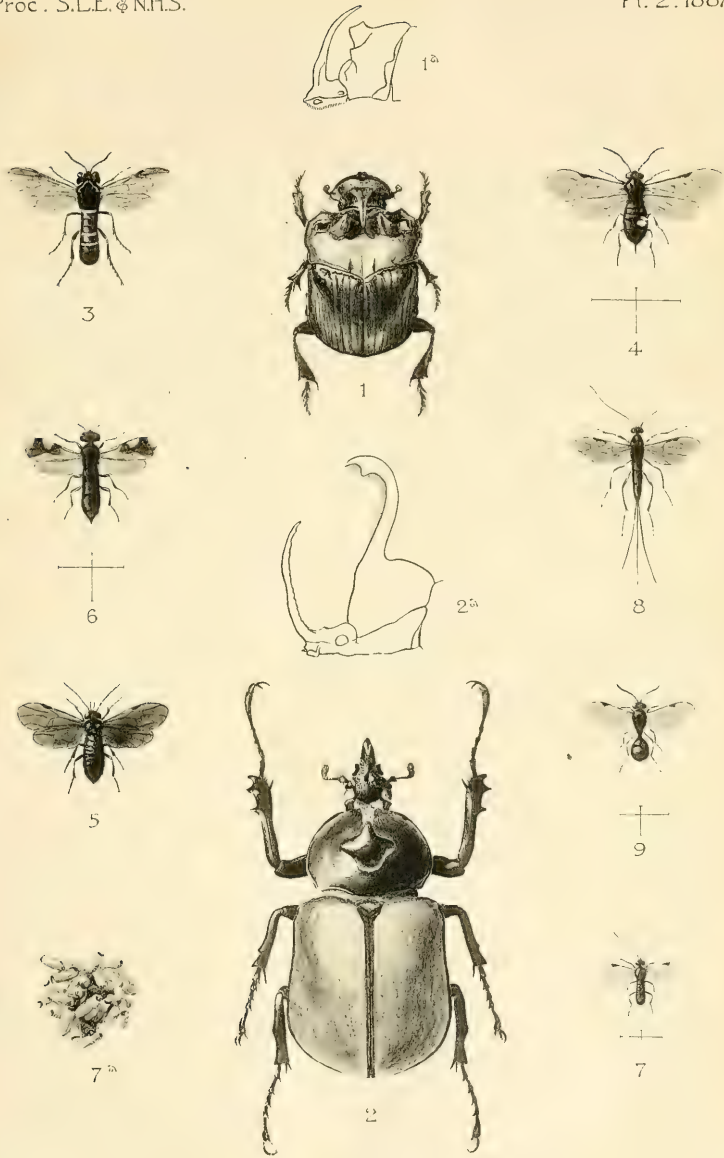
W. H. TUGWELL, }
J. W. TUTT. } Auditors.

PLATE I.

- Fig. 1. *Melitæa cinxia*, L., ♂, var. (upper and under surfaces),
page 65.
- „ 2. *Melitæa cinxia*, L., ♀, var. (upper and under surfaces),
page 65.
- „ 3. *Lycæna icarus*, Rott., ♂, var. (underside), page 62.
- „ 4. *Spilosoma menthastri*, Esp., var., page 77.
- „ 5.)
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- „ 14. }
- „ 15. *Ephestia kühniella*, Zell., pages 20 and 58.

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- Fig. 1. *Phænus principalis*, Dup., ♂, page 54.
- „ 1a. Sectional view of Head and Thorax.
- „ 2. *Golofa hastatus*, Bur., ♂, page 52.
- „ 2a. Sectional view of Head and Thorax.
- „ 3. *Allantus marginellus*, Pz., ♂, page 55.
- „ 4. *Blennocampa alternipes*, Klug., ♀, page 55.
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- „ 7. *Apanteles zygænarum*, Marsh, ♂, bred from *Melitea aurinia*,
page 57.
- „ 7a. Cluster of cocoons, from which *A. zygænarum* was bred.
- „ 8. *Macrocentrus marginator*, Ns., ♀, page 50.
- „ 9. *Stilpnus deplanatus*, Gr., ♂, page 50.



PRESIDENT'S ADDRESS.

GENTLEMEN,

The time has arrived when it devolves upon me to discharge the final duty pertaining to the office to which you so generously elected me, for the second time, twelve months ago, by addressing you upon the progress of the Society during that period ; a duty with which I have pleasure in complying.

The past year has again been one of advancement ; and alterations of some importance in the conduct of the affairs of the Society have been made. In the first place, the nights of meeting have been changed from the first and third to the second and fourth Thursdays in each month. In the early days of our existence, it was, I believe, the custom to meet every Wednesday evening for the transaction of business ; but, presumably on account of the inconvenience of such an arrangement, the meetings were made fortnightly, and other alterations were from time to time considered necessary, until we found ourselves meeting regularly twice in each month, on the first and third Thursdays. But as the membership increased, it appeared that this selection was an unfortunate one, as these particular evenings clashed most annoyingly with the meetings of another and more learned Society. It was therefore deemed desirable to accept the exigence of the situation, and the alteration above referred to was duly accomplished at the commencement of the year ; and we are now, I believe, in the happy position of having meeting nights that we may call practically our own.

Then, again, the place of meeting has been changed. For some time prior to the close of the previous year, it was foreseen that a shift of quarters might not be disadvantageous, if suitable premises could be found. The Rooms we then occupied were hardly so comfortable as one could wish, and

occasionally the meetings were inconveniently crowded ; in addition to this, we had no definite agreement as to our tenancy, and there was a possibility that we might be told at any moment to turn out ; but the "last straw" was a notice of increased rent, and it was considered by the executive to be high time to inquire what other suitable accommodation existed. In their search they were fortunate in having the services of, as my friend, Mr. Weir, very aptly put it, "a man on the spot," in the person of Mr. T. R. Billups, through whose instrumentality our present Rooms were put before the Council on conditions that appeared to them to justify their bringing the matter before a Special General Meeting. This was done, and it was decided that the proposed move should be made ; the concluding arrangements were got through, and the necessary agreement, the preparation of which was very kindly undertaken by Mr. T. W. Hall, was duly signed, sealed, and delivered ; and on Thursday, the 10th February, the first meeting was held in these Rooms.

The question that will naturally present itself to your minds is, Have these changes proved advantageous to the Society? The Reports of the Council and various officers that you have already heard will, to some extent, have answered this ; but it may be well, in passing, to examine some of the items touched upon more closely than is expedient in such reports. In the first place, is the position of our place of meeting as convenient as formerly? I think that you will all agree with me that it is so ; and I venture to think, also, that it would be difficult, if not impossible, to find any locality offering greater facilities in this respect. Its close proximity to the stations of the Southern railways and tram-lines render it especially suitable to the requirements of the large number of our members living south of the Thames, while its contiguity to the Monument Station of the Metropolitan Railway brings it within easy access of the districts lying in a more northerly direction ; the Rooms themselves are, you will readily admit, a great improvement on any that

we have occupied in recent times, and present conveniences equal to the most exacting demands of the present position of the Society. Then as to our membership. The gross gain during the year is within two of fifty per cent. ; this does not, however, represent the actual increase in numbers. Of course there is the other side to be looked at—the losses that have to be deducted. No matter how great or strong a society may be, there must be a continual loss of members; the strongest society that ever existed would, unless continually supplied with new blood, in the shape of additional members, inevitably die out. Happily our losses have been inconsiderable. One member only has resigned, we have to deplore the death of one, and the names of seven have been removed from the books, leaving us at the present moment with a total membership of 148—a larger number, I believe, than has ever previously stood on the books of the Society.

The financial position of the Society, as you have already heard by the Treasurer's Balance Sheet, continues to remain sound. Although the actual cash balance in the hands of the Treasurer is not quite so large as at this time last year, the deficiency is accountable for in that we are now paying a somewhat increased rent; and many of our new members having been elected at comparatively recent dates, their subscriptions are not included in the present Balance Sheet. There is therefore good reason to believe that the Society is in this respect in an even stronger position than formerly.

The attendance of members at our meetings continues to be satisfactory, the average at the twenty-one meetings held in these Rooms being thirty-two; it must, however, be borne in mind, when considering these figures, that the twenty-one meetings do not represent the whole of the year; two that were largely attended were held in the old rooms in January, and of course this evening's numbers are of necessity omitted. On the other hand, the whole of the summer meetings, which never are very large, are included, and materially affect the result. It is satisfactory to know that the smallest attendance during the whole year was twenty, and this in the

height of summer, when the majority of the members are more busily engaged upon field than Society work. These numbers will be found to compare favourably with the records of even recent years ; and it is no great way that one has to look back to find a time when what was this year our smallest meeting would have been considered a splendid attendance.

The Exhibits at our meetings have again included objects in varied branches of Natural History, many of them in themselves of much interest, and frequently accompanied by carefully worked-out notes, which could not fail to materially increase their scientific value, and affording an opportunity for the discussion of matters relating to them not otherwise attainable.

The typical collections, under the care of our Hon. Curator, Mr. W. West (Greenwich), are maintained in good order, and have been enriched by the addition of specimens from some few of our members. Their efficiency would, however, be much increased were they more complete ; and I feel confident that there are many among our present members who only need to be informed of the state of the case to induce them to render the necessary assistance. If each member were to hand over to the Curator any spare duplicates that he may have of species that are wanting in the Society's collections, there would very shortly be few blanks left.

The Library has been improved by the presentation of sundry volumes and periodicals by members and friends of the Society, to whom our best thanks are due ; also by the purchase of others ; and various magazines that have been acquired in parts have been bound, and are thus in a condition to be of use to members. It was with much regret that I learned some few weeks since that Mr. W. Chaney, who has so efficiently filled the post of Honorary Librarian since the commencement of 1883, would be prevented by his domestic arrangements from again offering himself for re-election. To his energy and untiring attention the present satisfactory condition of our Library is largely due. If he had a fault, he erred in the smallness of his demands upon

the Society's funds; and during the five years that he has had control of the Library, the Council have had the satisfaction of knowing that whatever grants were voted to his department would be well spent; and I feel that in expressing to Mr. Chaney our high appreciation of his services, I am but echoing the sentiments of every member of the Society. In the ability of the gentleman whom you have chosen to succeed to this important post we have every reason to repose the utmost confidence; to Mr. Rice, library work is no new matter, and under his care our Library will doubtless continue to maintain its accustomed efficiency.

The preparation of the "Fauna of the South-Eastern Counties," to which I referred in my Address to you at our last Annual Meeting, has made less satisfactory progress than I then anticipated. Some good work has already been accomplished; but there remains much more to be done before any portion of it can be brought to a satisfactory issue. Material assistance may be rendered by the general body of our members to those more intimately engaged upon the work by preparing lists of the districts coming under their observation, and the particular orders that they make their study, and forwarding them to the Secretary. Until such lists are received in some numbers, it is impossible that any great portion of the work can be satisfactorily proceeded with.

The revision of the Society's Rules, to which I referred in my former Address, has been placed in the hands of a representative Committee, and the result of their labours will very shortly be brought before you for consideration and adoption.

A Cabinet Club that was started in 1886, with a view to enable members desirous of so doing to obtain a cabinet without any large immediate outlay, has progressed satisfactorily; seven shares have already been drawn, and the cabinets that have been delivered have met with approval. It is probable that the whole of the twelve shares will be allotted before the end of the coming year; and the promoters of the Club are to be congratulated upon having thus far successfully carried out their undertaking.

It is with much satisfaction that I note a considerable increase in the number of papers read before the Society, and our thanks are due to their respective authors for the great care evinced in their preparation. The various subjects dealt with will doubtless be treated in detail elsewhere ; it is therefore unnecessary that I should recapitulate them here.

Two novel features have also been introduced at our meetings, with a good measure of success. The one, a "Microscopic Evening," brought together some score or so of instruments, and afforded a fitting opportunity for members working on the more minute forms to compare notes, and proved a most interesting meeting to the general body of members. The other was an exhibition of Photo-Micrographic slides, by aid of the Sciopticon Lantern, by Mr. Smith, of the Sciopticon Company, to whom the thanks of the Society are due, for providing a most pleasant and instructive entertainment. And I trust that the success with which these first attempts were attended may induce further trials in a similar direction.

I am also pleased to note the receipt of an increased number of communications from our corresponding members, which have induced discussions of interest not only to the meetings at which they have been read, but doubtless to their senders also ; and I trust that our corresponding members will continue to avail themselves of the opportunities thus offered to ventilate their observations and queries to a still larger extent in the future.

During the summer months four excursions were held, as follows :—

May 14th, the Zoological Society's Gardens, under the guidance of Mr. J. Jenner Weir, who gave most interesting notes upon the various animals inspected.

June 14th, Epping Forest, Loughton to Chingford, when Mr. Oldham took charge of the party. Although the weather of the previous few days had been anything but promising, this particular day was very fine, and insect life was fairly abundant, but, as far as Lepidoptera was concerned, confined

to comparatively few species. It was noted that the Hornbeam (*Carpinus betulus*) was literally stripped of its leaves by the larvæ of *Cheimatobia brumata*, L.

June 25th, Leatherhead, Mickleham Downs, Headley Lane, conducted by Mr. E. Step, Mr. Billups, who was to have assisted, being unavoidably prevented by domestic affliction. Mr. C. A. Briggs very kindly undertook his portion of the programme, and piloted the company through a most productive-looking country, in which many interesting objects, Zoological, Entomological, and Botanical, were noted, and several good captures made.

July 16th, Sevenoaks, Knole Park, Fawke Common. Mr. J. T. Williams acted as guide, and led the way through some of the most promising parts of the district, pointing out the localities and objects of especial interest by the way, thus affording a pleasant and instructive time to those fortunate enough to be present.

On the whole, the attendance at these excursions was, to say the least, disappointing. In the case of that to the Zoological Society's Gardens, its smallness was no doubt, to some extent, to be accounted for by the date having unfortunately been fixed for the day on which the Queen visited the City; this counter-attraction proving too much for many who would otherwise have been present; but I am utterly at a loss to understand the apparent apathy shown; especially by our younger members, on the other occasions. I know of no more ready means of gaining information than these field-days; and I venture to hope that, should members be found willing to undertake the conduct of similar excursions in the future, as they have done in the past, often at considerable personal trouble, they will be much more liberally supported by the general body of members, so that the stereotyped party of a dozen of the present year may be very largely augmented.

The arrangements for the Annual Exhibition were made on a scale far exceeding anything attempted in recent years, and in the result proved successful beyond the most sanguine

expectations of those having charge of them. The Committee of Management were fortunate in having at their disposal a largely-increased room-space, and were thus enabled to provide and fully allot upwards of 1200 superficial feet of table-space for exhibits requiring that class of accommodation ; several larger objects found place in other parts of the building ; and in addition a room was set apart for the exhibition of Photo-Micrographic slides by aid of the Sciopticon Lantern, to which two large audiences were attracted. The thanks of the Society are due to Mr. Smith, of the Sciopticon Company, for thus providing a most interesting entertainment. The exhibits embraced objects in almost all Biological orders, and it is impossible for me here to enter into general detail ; but one or two special features should not be allowed to pass unnoticed. The gathering together of a vast collection of Lycænidæ from all quarters of our South-Eastern district, including probably all known forms, together with many from the Continent of Europe, could not fail to be of interest to many entomologists who have recently shown a disposition to enter into controversy upon this family, and it is to be hoped may have formed a common ground upon which to adjust their differences of opinion. The cases of exotics reared in the Zoological Society's Gardens, and exhibited by that Society, and the educational series arranged by Mr. S. L. Mosley, including the complete life-history of *Cecidomyia destructor*, Say., attracted considerable attention. A novel feature was the exhibition by Messrs. Geo. Neighbour and Son of improved Bee-keeping Appliances, illustrating the ease with which bees may be profitably kept, and their manner of working observed. A large table of Fungi, collected near Esher, on the Monday preceding the Exhibition, and arranged by Messrs. Carrington and Step, indicated a vast field open for profitable research, and appeared to be much appreciated. Among the large number of Microscopes that were set up, were several by Messrs. R. and J. Beck, in which the latest improvements in the arrangement and use of such instruments were seen to advantage. To our numerous

friends, and to the various Societies who contributed so largely to the success of the Exhibition by the loan of valuable objects, and in sundry other ways, our best thanks are due. And the readiness with which the general body of our members came forward to support the Committee in the arduous task that they had undertaken—many of them placing large portions of their valuable collections at their disposal, is deserving of all praise, and is but another proof of their earnestness in the Society's work. Of course such an Exhibition could not be carried through without considerable expenditure ; and although sundry members most generously took upon themselves the task of defraying the cost of various desirable accessories which tended much towards a successful issue, it required a substantial vote from the Society's funds to cover the actual necessities of the case. The question has been raised whether it is desirable that the Society should be put to so large an expenditure with this object. I have very carefully watched this point for some time past, and am fully convinced that the Exhibitions of the last few years, although admittedly a considerable tax upon the finances for the time being, have been, in the result, a decided source of strength to the Society ; there is little doubt that many whom we now number among our members have at our Annual Exhibitions realised, for the first time, the advantages of united action such as is offered by the Society ; and, further, many friends who have never previously bestowed much thought upon Natural History subjects, when once there, evince a lively interest in the exhibits, and some of them may be led to take up some branch as a study, and even become useful workers in the cause of Natural Science. This alone should be a strong incentive to us to continue our exertions in this direction ; and I trust that the day may be far distant when it is found necessary to abolish, or even curtail, this portion of our annual programme.

Since our last Annual Meeting the British Insect Fauna has received many additions, of which I propose to give some particulars, and, where possible, also references to the pub-

lished records, which, I trust, may be of service to those wishing to inquire more fully into the circumstance of their capture.

Coleoptera :—

Homalota consanguinea, Eppelsheim, *Scopæus cognatus*, Muls. et Rey, *Bledius dissimilis*, Er., *Bythinus validus*, Aubé, *Micrambe abietis*, Payk., *Atomaria rhenana*, Kr., and *Læmophlæus pusillus*, Schön., are added to our lists by Rev. W. W. FOWLER, from specimens taken during the past few years, and now identified ("Ent. Mo. Mag." xxiv. 49).

Otthebius auriculatus, Rey., from the Isle of Sheppy, *Limnius rivularis*, Rosenh., found by the late Dr. POWER at Woking, and *Tropiphorus obtusus*, Bonsd., taken by Dr. SHARP in Dumfriesshire, were exhibited by that gentleman at the November meeting of the Entomological Society of London, having been recently identified.

Orthoptera :—

Periplaneta australasiæ, F.; Mr. R. McLACHLAN makes this addition from examples taken by Mr. BARRETT at Belfast in 1866 ("Ent. Mo. Mag." xxiii. 235).

Neuroptera :—

Holocentropus stagnalis, Albarda., a species of *Trichoptera*, is recorded as British by Mr. J. E. FLETCHER, who obtained the males by sweeping the water-plants growing in a pond at Grimley, Worcestershire, and the females by beating an adjacent hawthorn hedge ("Ent. Mo. Mag." xxiv. 43).

Apatania fimbriata, Pict., another species of *Trichoptera*, is added to our fauna by Mr. KENNETH J. MORTON, from specimens taken near Killarney, Ireland, as well as

Tinodes maculicornis, Pict., from the North of Ireland ("Ent. Mo. Mag." xxiv. 118, 136).

Hymenoptera :—

Nematus oblongus, Cam.,

„ *pallipes*, Fallén,

„ *fagi*, Zad.,

„ *laricivorus*, Zad. (Plymouth, C. G. Bignell),

Ægilips bicolorata, Sp. n. (probably from London district),

are contributed by Mr. P. CAMERON, F.E.S. ("Ent. Mo. Mag." xxiii. 193).

Tapinoma melanocephalum, For., an ant new to this country, was found by Mr. T. R. BILLUPS in the Palm House at Kew Gardens, and exhibited by him at our meeting on March 10th (see also Entom. xx. 184).

Strongylogaster macula, Klug., a species that appears not to have been previously noted in England, is identified by Mr. P. CAMERON from a specimen taken by Mr. McLACHLAN, in his garden at Lewisham, in June last ("Ent. Mo. Mag." xxiv. 45).

Lepidoptera :—

Parnassius delius, Esq. : the capture of a specimen of this butterfly by Mr. E. W. SCHWARTZ near Bangor, North Wales, in September, is reported by Mr. E. MERYWICK, who suggests that its presence in so unlikely a locality was probably due to man's agency rather than the laws of nature. Its range on the Continent appears to be confined exclusively to Alpine districts ("Ent. Mo. Mag." xxiv. 130, "Entom." xx. 301).

Polyommatus alciphron, Rott., = *hipponoë*, Esp., var. *gordius*, Esp., is reported as having been taken at Tiverton in 1886, by Mr. F. G. JOHNSON. There is no reason to doubt the *bonâ-fides* of the captor; but in this, as in the previous case, further evidence is desirable before accepting it as an addition to the British Fauna ("Entom." xx. 173).

Notodonta torva, Hub. : this interesting and handsome species is added on the authority of Mr. C. G. BARRETT, who detected a single specimen among a series of *N. trepida*, Esp., in the cabinet of Mr. F. NORGATE, of Downham, Suffolk, who had reared it some six years ago from ova or larvæ that he found in Norfolk. The larva, which closely resembles that of *N. ziczac*, L., feeds on the Aspen (*Populus tremula*), and is full-fed in September. The species is widely distributed on the Continent ("Ent. Mo. Mag." xxiii. 276).

Acidalia immorata, L. Two examples (♂ and ♀) of this species were taken by Mr. C. H. MORRIS, of Lewes, flying over heather (*Calluna vulgaris*) near that town on 27th June last, and were exhibited at the Society's meeting by Mr. J. H. A. JENNER on 13th October. At the Entomological Society's meeting in November Mr. SAMUEL STEVENS exhibited a specimen of this species that he obtained some thirty years ago at the sale of Mr. Desvigne's collec-

tion, and which he had since kept in his cabinet as a doubtful species of the genus *Strenia*, Dup., or *Fidonia*, Tr. Mr. J. JENNER WEIR informs me that it is very probable that it was taken at Lewes by the late Mr. Hopley, who some forty years ago was a frequent correspondent of Mr. Desvignes; it is therefore by no means unlikely that all three specimens were taken on the same or closely approximate ground, but at periods separated by nearly half a century (see also "Entom." xx. 289).

Ephestia kühniella, Zell., appears to have been identified by Mr. G. C. BARRETT, from specimens received from Mr. W. THOMPSON, of Stoney Stratford, who had reared them from larvæ found feeding in a mixture of ground rice and wheat-meal in a bakehouse in that neighbourhood ("Ent. Mo. Mag." xxiii. 255). Mr. R. SOUTH informs me that some two or three years since he reared two moths from larvæ received in ground rice from a grocer's in London, which must undoubtedly be referred to this species. During the past summer the larvæ have been found in countless numbers in one of the dock warehouses in London feeding in American meal that had been brought to this country from Fiume, on the Adriatic, where it is probable they were introduced. The damage caused by them in this instance is very extensive, and there is the unpleasant prospect that if once fairly established the species may become one of our most serious insect pests. Happily within the last few weeks enormous swarms of *Braconidæ*, which are evidently parasitic on the lepidopterous larvæ, have been found in the neighbourhood of the infected meal, and will doubtless do much to mitigate the evil. Some of these larvæ were exhibited at the Society's meetings by Mr. T. D. A. COCKERELL when first discovered, and imagines bred from them have since been shown by other members.

Tortrix decretana, Tr., a species closely resembling the common *T. podana*, Scop., and with which it appears to have been confused by its captor, Mr. E. A. ATMORE, of King's Lynn, until extricated from a series of that species by Mr. W. WARREN, who gives a description of its distinguishing characters ("Ent. Mo. Mag." xxiv. 125).

Stigmonota pallifrontana, Z. This interesting addition to the British Tortrices is another of Mr. W. WARREN'S identifications, the specimens having been taken by Mr. W. THOMPSON some eight years since, probably by sweeping flowers of *Heracleum sphondylium*. The species somewhat closely resembles *S. internana*, Gn., in general appearance, and the larva is said to feed in the green pods of the

milk vetch (*Astragalus glycyphyllos*), being full-fed at the beginning of August ("Ent. Mo. Mag." xxiii. 232).

Butalis siccella, Zell., which so far as its occurrence in this country is concerned, appears previously to have been confused with *B. variella*, St., is identified by Mr. E. R. BANKES, who took specimens in June, 1886, near Weymouth, Dorset. On the Continent the larvæ have been found in sand-tubes several inches long, under both thyme (*Thymus*) and crowberry (*Empetrum*) ("Ent. Mo. Mag." xxiii. 275).

Gelechia (Lita) blandulella, Sp. n., a species closely resembling *L. maculea*, Haw., is described and named by Mr. J. W. TUTT from specimens taken by him on the Deal sand-hills ("Ent. Mo. Mag." xxiv. 105); and examples were exhibited at the Society's meeting on 25th August.

Gelechia semidecandrella, Sp. n. Under this name Mr. J. H. THRELFALL describes a species closely resembling *Lita maculiferella*, Douge., that he bred from larvæ feeding in the shoots, flowers, and seeds of the little mouse-ear (*Cerastium semidecandrum*), ("Ent. Mo. Mag." xxiii. 233, "Entom." xx. 65).

Elachista scirpi, Sp. n., is named and described by Mr. H. T. STANTON from specimens bred by Mr. W. H. B. FLETCHER from larvæ mining "the leaves of the sea club-rush (*Scirpus maritimus*), growing in a ditch near Worthing, Sussex. The species was first taken by Mr. BARRETT in a salt marsh near Pembroke in 1875-6, but was then not distinguished from the closely-allied *E. rhynchosporella*, Sta. ("Ent. Mo. Mag." xxiii. 253-4).

Doryphora quæstionella, H-S., which appears to have been occasionally taken at Wicken Fen for some years past, and to have universally passed as *D. morosa*, Mühlig., is identified by Mr. W. WARREN ("Ent. Mo. Mag." xxiv. 104).

Nepticula woolhopiella, Sp. n., was bred by Dr. J. H. WOOD, of Tarrington, from larvæ found feeding in beech leaves, and described and named by Mr. H. J. STANTON ("Ent. Mo. Mon." xxiv. 62).

Diptera :—

Orimarga virgo, Ztt., an important addition to the British *Tipulidæ* ("Ent. Mo. Mag." xxiii. 205), and

Limnophila aperta, Sp. n. ("Ent. Mo. Mag." xxiv. 108) are recorded by Mr. G. H. VERRALL; while Mr. R. H. MEAD describes several new species of *Anthomyiidæ*, including

Polietes hirticura, from a single specimen taken near Bolton Abbey.

Hydrotæa similis, 2 ♂ from Douglas, Isle of Man, and

Homalomyia nigrisquama, ♂, from near Bicester and Ulverston. Mr. MEAD also makes some important corrections in Synonymy ("Ent. Mo. Mag." xxiii. 179, 250).

Hemiptera—Homoptera :—

In notes on some British *Coccidæ*, Mr. J. W. DOUGLAS describes new species as follows :

Ischnaspis filiformis ("Ent. Mo. Mag." xxiv. 21).

Lecanium beaumontiæ ("Ent. Mo. Mag." xxiv. 95).

Lecanium longulum ("Ent. Mo. Mag." xxiv. 97).

Orthezia insignis ("Ent. Mo. Mag." xxiv. 169).

Having thus noted some of the more important of the additions to our British lists, it may be well to glance briefly at some of our rarer species or occasional visitors.

Lepidoptera :—

Aporia cratægi, L. After its reported complete disappearance from Kent, the record of the capture of seven specimens near Sandwich on July 13th is interesting ("Ent. Mo. Mag." xxiv. 131).

Colias Edusa, Fb. A single specimen was observed by Mr. T. H. BRIGGS at Effingham on June 19th ("Entom." xx. 181), but the only record that I have received of an autumn capture is one near Carnforth, reported by Mr. H. MURRAY.

Vanessa antiopa, L. A specimen was seen by Mr. F. W. FROHAWK at Balham on 6th August ("Entom." xx. 322), and another by Mr. W. J. H. NEWMAN in Oxfordshire on the 14th of that month ("Entom." xxi. 12), but neither was secured.

Anosia plexippus, L. After being taken in increasing numbers for some years, is this year, so far as present records are concerned, conspicuous by its absence—a state of things that suggests a further trial of patience before accepting it as an acclimatized British subject.

Acherontia atropos, L., has been unusually scarce, whereas,

Sphinx convolvuli, L., has occurred throughout the length and breadth of the United Kingdom in considerable numbers.

Deilephila euphorbiæ, L., is reported by Mr. G. C. BARRETT ; single specimen having been taken in his garden at King's Lynn ("Ent. Mo. Mag." xxiv. 114, 132).

D. livornica, Esp., was exhibited at the Society's meeting on April 28th, by Mr. HELPS. The specimen was taken in the beginning of February at Coles Cross in Somerset (about twelve miles inland), where it flew in at a cottage door, evidently attracted by light.

Chærocampa celerio, L., has fallen to the lot of Mr. H. MURRAY, of Carnforth.

Callimorpha hera, L., has again been taken in its accustomed locality in Devonshire by both Mr. W. F. DE V. KANE and Mr. J. JÄGER. Whatever may have been the origin of this insect in this country, there can now be no doubt that it occurs in this locality under natural conditions.

Catocala fraxini, L. A single specimen is reported by Mr. R. W. BOWYER to have been picked up on a path at Hertford ("Entom." xx. 306), and one by Mr. H. M. LEE, of Sutton, Surrey, who took it on a tarred paling on September 18th ("Entom." xx. 325).

Eupithecia extensaria, Freyer., has been turned up on the Norfolk coast by Messrs. A. E. ATMORE and G. C. BARRETT, who secured some nine examples in all. They were driven out of *Artemisia maritima*. The species does not appear to have been previously recorded for some years ("Ent. Mo. Mag." xxiv. 114).

Hymenoptera :—

Blennocampa atterima, Klug., and *B. alternipes*, Klug., two rare sawflies, were exhibited at the Society's meetings by Mr. T. R. BILLUPS, who took them at Chobham and Boxhill respectively.

Diptera :—

Cecidomyia destructor, Say., has been observed in greatly increased numbers in several parts of the country, and in some localities has created quite a panic among growers of cereals. Whether this pest is of recent importation, or whether it has long found a home within our shores, but escaped observation, appears to be a point on which those best calculated to form an opinion are not agreed ; but we have the satisfaction to know that several species parasitic upon it have already been discovered to be here, and further, that the average British climate has not yet been proved to be favourable to its continual and rapid increase (see "Entom." xx. 262, 317, 327).

During the year a very considerable amount of Literature bearing upon Biological subjects has been published. Two pamphlets, not previously noticed, are worthy of especial mention, as relating to matters closely connected with the work of this Society, I refer to the "List of Lepidoptera of West Sussex," by Mr. W. H. B. Fletcher, and the "List of Lepidoptera of East Sussex," by Mr. J. H. A. Jenner; which, if not perfect as recording every species that has occurred in the districts of which they respectively treat, are well worthy of careful perusal by all interested in the geographical distribution of Lepidoptera.

Among the more important of general works, I note the following :—

"Coleoptera of the British Isles," by Rev. W. W. Fowler. Vol. I., Adephaga—Hydrophilidæ, has been completed, the monthly parts having been issued to subscribers with praiseworthy punctuality. (London : L. Reeve & Co.)

"The Larvæ of the British Butterflies and Moths," by the late William Buckler, Vol. II. (The *Sphinges* and part of the *Bombyces*), being the Ray Society's vol. for 1886, was issued in March of the present year. The plates, if possible, excel in execution those of the previous volume, and the descriptions, consisting of Mr. Buckler's notes, with copious additions by the Rev. John Hellins, are probably the most important yet published. The work is edited by Mr. H. T. Stainton, and will doubtless prove a most valuable addition to our Entomological literature.

"The Cockroach : an introduction to the Study of Insects," by Profs. L. C. Miall and Alfred Denny, treats in popular language of the life-history of *Periplaneta orientalis* and its allies, and is illustrated by upwards of 100 drawings. (London : L. Reeve & Co.)

"Ants, Bees, Dragonflies, Earwigs, Crickets, and Flies," by W. Harcourt Bath, is a handy little volume, avowedly for beginners; it is liberally illustrated, and the explanations are clear and concise; it cannot fail to be a useful assistant

to anyone about to commence the study of these most interesting insects. (London: Swan, Sonnenschein & Co.)

"British Stalk-eyed Crustacea and Spiders," by F. A. A. Skuse. In this work the author treats, in a simple form, of the structure, habits, and habitats of the orders referred to, the methods employed for their capture and preservation, and their classification, under which head the distinctive characters of the various families are briefly noted. This book, which is in uniformity with the last-mentioned, is illustrated with many woodcuts, and should prove a useful companion to the young collector, to whom, we are informed, it is especially addressed. (Same Publishers.)

"Rough Notes on the Birds observed during Twenty Years Shooting and Collecting in the British Islands," by E. T. Booth, was commenced in 1881, and has been issued in parts at intervals; part XV., which has recently appeared, bringing it to a conclusion. The work is carefully illustrated, and contains many interesting and valuable notes relative to some of our rarer birds, not to be found elsewhere. (London: R. H. Porter.)

"Report on the Migration of Birds in the Spring and Autumn of 1886," by a Committee of the British Association. The eighth annual report contains much information of considerable value. (Edinburgh: Macfarlane & Erskine.)

"British Birds Eggs," by A. G. Butler. Parts IV.—VI. have been published, completing the work. (London: E. W. Janson.)

Geo. Bentham's "Handbook of the British Flora." A fifth edition, revised by Sir J. Hooker, has been issued. (London: L. Reeve & Co.)

"The Life and Letters of Charles Darwin," edited by his son, Francis Darwin, will doubtless be a welcome addition to most libraries, and cannot fail to be of deep interest to all thinking men, and especially to those who have studied Natural History. (London: John Murray.)

"*Rhopalocera Niponica*," by H. Pryer. An illustrated book on the Butterflies of Japan, in three parts, of which the first

part has been recently issued, although somewhat outside the work of this Society, is worthy of mention as being the first book of this description executed by Japanese Native Artists. The letterpress, which is in both languages, English and Japanese, as well as the plates, are printed on Japanese untearable paper. (China and Japan: Kelly & Walsh; London: E. W. Janson.)

The Obituary this year is a heavy one, and includes many familiar names—names that we shall long remember—and among them one of our own members,

WILLIAM FARREN, of Cambridge, who died November 21st. His chief attention was directed to Lepidoptera, which he commenced to collect at the early age of 10. He was one of the old school of Entomologists, and was familiar with the haunts of many of our fen species, some of which are now extinct. Some years since he almost abandoned active Entomological work; but recently, to some extent with a view of imbuing his son with a liking for his own favourite study, an attempt in which he was not unsuccessful, he took again to active field work, and was successful in re-organizing a very considerable collection of British Lepidoptera. He was an occasional contributor to the Entomological Journals, became a member of this Society in 1886, and had sent several interesting exhibits to our meetings. But his renewed career was of short duration; for some time past he had been in failing health, and he died of consumption at the age of 51.

JOHN SANG. Born at Darlington, March 3rd, 1828, died March 20th, 1887. From early life he appears to have had a taste for collecting insects, but it was not until he attained the age of 20 that he took up the study of Entomology in earnest. His retentive memory and his knowledge of the French and Latin languages, coupled with a natural talent for drawing and painting, were of great assistance to him in his favourite study, and contributed in no small way to his successful Entomological career. Brought up as a draper,

he was ultimately enabled to retire, and he then devoted the greater part of his time to the study of Insects, the Tineina being his especial favourites. But an unfortunate event happened. Having become security for a friend who failed, it became necessary for him to part with his magnificent collection, containing upwards of 30,000 specimens; and it was brought to the hammer at Stevens's in June, 1882. So untoward an event to a man nearing 60 years of age, would have been well calculated in the majority of instances to lead to despair, but his natural equanimity stood him in good stead even at so trying a time, and he set about finding a means of retrieving his losses, and proposed resuming business in a subordinate capacity. But his Entomological talents were too well known to be allowed to be lost to science, and he was accordingly offered the curatorship of Dr. Mason's extensive collections, which he accepted; in addition to which he was engaged in delineating, for that gentleman, numerous species of Coleoptera, his execution of the plates being exceedingly correct. He also again commenced the formation of a collection of Lepidoptera, in which he made considerable progress, as was evinced by the rapid diminution of his list of desiderata, which it was my privilege from time to time to inspect. He made several additions to the British Insect Fauna, one of them, *Gelechia sangiella*, being named after him. Although he had for some time been in failing health, there was, up to the time of his retiring to rest on the night of his decease, nothing to lead to the supposition that his end was so near at hand, and a letter that I received from him within a few hours of that lamentable event, was in his usual kind and genial style. He was found dead in his bed on the morning of Sunday, March 20th.

Rev. JOHN HELLINS, M.A., died May 9th, in his 58th year. He took his B.A. degree at All Saint's College, Oxford, in 1851. He was for some years master of Exeter Grammar School, and afterwards succeeded his father as Chaplain to the Devon County Prison, which appointment he held until some seven years ago, when he was compelled to retire on account

of ill-health. For upwards of thirty years his name has been well known as an Entomologist, and there are frequent notes from his pen in the "Entomologist's Weekly Intelligencer," and "The Entomologist's Monthly Magazine." He paid much attention to rearing Lepidoptera from the egg; and on the death of his friend and fellow-worker, the late William Buckler, he undertook the arduous task of supplying the text for the Ray Society's volumes to many of the figures left by that gentleman without descriptions. Since his lamented death this important work has been taken up by that able entomologist, Mr. W. H. B. Fletcher, of Worthing, whose occasional appeals for ova, larvæ, etc., to enable him to worthily complete this great work, are deserving of the liberal response of all interested in the life-histories of our British Lepidoptera.

JAMES MCGROUTHER. Died at Glasgow, February 4th, in his 23rd year. From boyhood he took much interest in Entomology, and the formation of the now flourishing "Clydesdale Naturalists' Society" was in a large measure due to his enterprise.

THOMAS WILSON, one of the oldest York entomologists, died April 17th, aged 51. He was a frequent contributor to the "Entomologist" and "Naturalist;" he paid considerable attention to the Tenthredinidæ, and at the time of his death was engaged upon a list of the Lepidoptera of Yorkshire.

ROBERT FRANCIS LOGAN, of Colinton, near Edinburgh, died July 28th, aged 60. From boyhood his attention was directed to the study of his native Lepidoptera, and during his later years he manifested a keen interest in the Coleoptera also. He contributed many articles to the various magazines.

ROBERT GRAY. Died at Edinburgh, February 18th. His chief study was the Birds of his native country, and to his pen we are indebted for "The Birds of Ayrshire and Wigtownshire," published in 1869, and his larger and more important work, "The Birds of the West of Scotland," published 1871.

JOHN GATCOMBE. Died April 28th, aged 68. He was born at Knowle, Somerset, but the greater part of his life was spent at Plymouth, where he paid considerable attention to the habits of Birds, the seasonal changes of plumage in sea-birds being his especial study. He contributed frequent notes to the "Zoologist" and other publications, his accurate knowledge of his subject rendering them of peculiar value.

W. C. UNWIN, of Lewes, died April 23rd, aged 76. During his life he successfully studied many branches of Natural History; he was a skilled microscopist and draughtsman. His chief published work, "Illustrations and Dissections of the Genera of British Mosses," was illustrated by his own drawings.

And now, Gentlemen, having thus briefly reviewed the events of the past year, I beg, in conclusion, to express to you my high appreciation of the confidence that you reposed in me in electing me your President for the second time. I am aware that such a proceeding was at variance with the usage of this Society, and I should have felt great reluctance in continuing to hold office had I not believed that in doing so I should have the hearty support and confidence of the whole body of members; a belief in which I have now no reason to think that I was deceived. I beg to tender you my sincere thanks for the courtesy that you have shown me on all occasions, and to the Council, and especially to our Honorary Secretary, I am indebted for much valuable assistance, at all times freely accorded.

It is with feelings of unmingled satisfaction that I vacate the chair in favour of Mr. Billups, whom you have this evening elected your President; his many good qualities are too well known to you to need any recapitulation at my hands, but of the one great necessary for success we have already had good evidence—that he has the true interests of the Society at heart. Under such leadership, and with your general goodwill and confidence extended to him, as it has been to me, we have reason to look forward to renewed progress and continued prosperity in the future.

ROBERT ADKIN.

ABSTRACT OF PROCEEDINGS.

JANUARY 13th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. R. Frere was elected a member.

Mr. J. M. Adye exhibited *Dasycampa rubiginea*, Fb., and *Acherontia atropos*, L., both taken at Christchurch, Hants 1885.

Mr. J. A. Clark exhibited a male specimen of *Hybernica aurantiaria*, Esp., and a female of *H. defoliaria*, Clerck., which he stated he had taken in copulation, and had obtained ova, which, however, turned out to be sterile.

Mr. E. Joy exhibited a variety of *Lycaena corydon*, Fb., similar to fig. 1, plate 1, of "Entomologist," for January, 1887.

Dr. Rendall exhibited *Ino globulariæ*, Hb., *I. statice*, L., and *I. geryon*, Hb., from Lewes. Also *Eucosmia undulata*, L., and called attention to the tufts in the inner margin of the hind wings.

Mr. T. R. Billups exhibited a species of Coleoptera, *Brachycerus imperialis*, L., and read the following notes:—

"These fine Beetles belong to the family of Weevils (Curculionidæ, Latreille), a family of vast proportions, numbering already some 640 genera, and considerably over 16,000 known species. They are to be found in all parts of the world, and range in size from the most minute forms, that require the aid of a magnifying glass to distinguish the order they belong to, up to others that put even our specimens of *Brachycerus* in the shade. They are very destructive, particularly in the larval stage, feeding on nuts, seeds, the root, pith, and bark of plants, leaves, or flowers, and especially the fruits. Some are leaf-miners, and others are said to make galls. The pre-

sent specimens are from Japan. The species is also found in Southern Africa (where it attains a larger size), and also on the shores of the Mediterranean. These insects are in great repute with the Bechuana tribes, who use them as amulets, stringing them together on strips of leather, and hanging them round the necks of their children, considering them efficacious in time of teething, and particularly useful in mitigating the various ills children are liable to. Latreille informs us that the women of Ethiopia string these insects together, and wear them round their necks as an amulet."

Mr. T. D. A. Cockerell exhibited the following Mollusca :—*Helix aspersa*, Mull., var. *lutescens*, *Helix hortensis*, Mull., var. *rufozonata*, which he stated had been found living together on a bank at Torquay by Mr. F. W. Wotton, of Cardiff.

JANUARY 27th, 1887.

R. SOUTH, Esq., F.E.S., *Vice-President*, in the Chair.

Mr. F. H. Barclay and Mr. C. Roberts were elected members.

Mr. J. Jenner Weir exhibited *Nilasera pirama*, Moore, and *N. amantes*, Hewt., from Ceylon; also a piece of amber containing three specimens of Chrysomelidæ, one of Coccinellidæ, and one of Orthoptera.

Mr. Billups exhibited living specimens of *Rhagium bifasciatum*, Fab., from Braemar, and said that the species belonged to Latreille's family of Longicornia. In the larval stage it lived in old decaying trees, such as fir, oak, etc., in which it made a cocoon of chips, attaining the imago state in the autumn, but not finally leaving the tree until the spring. The specimens exhibited were forwarded to a member of the Society, among a number of larvæ, in a canister of rotten wood, and no doubt in their transit through the post the cocoons were broken, which would account for the unusual appearance of the imago at this season of the year.

Mr. J. Jenner Weir contributed the following "Notes on the Comparative Rarity of Lepidoptera-Rhopalocera, once common in the neighbourhood of Lewes."

“In presenting to the Society this evening a copy of my friend Mr. J. H. A. Jenner’s list of the ‘Macro-Lepidoptera of East Sussex,’ I deem it a fitting opportunity to make some remarks on the present scarcity in that district of several of the species of *Rhopalocera* which, in my young days, half a century ago, were frequently, or even commonly, met with.

“*Aporia cratægi*, L.—Mr. Jenner states, ‘Formerly at Holmbush, Henfield.’ When about the year 1838 I first in earnest commenced to make a collection of the British Lepidoptera, I was visiting my relations, in the month of June, at Keymer, a parish situated between the Burgess Hill and Hassocks Gate stations of the London and Brighton Railway. I sent to my uncle, the late Mr. Auckland, of Lewes, for a net, and he very kindly gave me the first I possessed; he was himself an entomologist, and I may say that it was mainly owing to him that I took up the study. As soon as I had obtained the net I went into a field at the back of the house, and the first insect I took was *Aporia cratægi*, and it was very abundant; probably I might have very easily taken a hundred specimens. This by no means surprised me, as Mr. Auckland had often told me that he had always obtained it in that neighbourhood for many years in succession. Being a young beginner, and feeling sure of taking it in after years, I captured but a moderate number; of these one still remains in my cabinet. A small mill-stream ran in front of the house, the sides of which were well-wooded, and here the insect abounded. I visited Keymer the next year, intent on taking more *A. cratægi*; I saw but one, and this I still possess. For some fifteen years I was often at Keymer, but never saw the insect again; and I believe that now I am the only Sussex entomologist living who has ever seen the species in plenty in that district; and it appears from Mr. Jenner’s note that the insect is extinct in the county.

“Mr. Auckland’s note, which I have before me, gives as localities, ‘Chailey, May 30th, 1834; Newick, June, 1835; Lindfield, June, 1836.’ My own opinion is that in the earlier decades of the century a flight of this insect visited Sussex from some part of the Continent, and that our climate has

not been favourable to its permanent establishment, and that it has gradually become extinct.

"*Aporia crataegi* has disappeared almost entirely from the New Forest, where I have taken it myself, and where it was at one time very abundant. It first became rare in the eastern parts of the Forest; it probably still lingers in the western parts, where I have taken it of late years; but in 1886 I could not hear that one had been seen.

"*Leucophasia sinapis*.—Mr. Jenner's note of this species is, 'Very scarce, and apparently extinct in many localities where formerly found.' This is quite in accordance with my own experience; it used to be taken by my uncle near Lewes in 1834, where it is now extinct; and although I often visit Abbot's Wood, and have done so for years past, I never found it there. This appears to me to be a case of an indigenous insect becoming extinct in certain parts of Sussex, which, from the weakness of its flight, was not likely to have flown over from the Continent, as might have been the case with *A. crataegi*, a gregarious insect, which *L. sinapis* is not.

"*Melitæa aurinia*.—Of this species Mr. Jenner's note is, 'Local and rare, Chailey and Ringmer.' I have sought in vain for this insect in Sussex; it was at one time very abundant at Chailey, the home of my ancestors. I recollect that some school-children brought over to Mr. Auckland from Chailey a clothes-basket covered with pinned specimens of *M. aurinia*; there were about 400. Mr. Auckland's note is as follows: 'Abounded at Chailey from 8th May to June, 1834; I had sent me many hundreds.'

"*Vanessa c-album*.—Mr. Jenner notes it as 'Very rare; once at Southover, Lewes; Guestling, rare; Tilgate.' I have never taken this species in Sussex; but in the hop-gardens it was once common—so much so, that the peasants had a local name for it, *viz.*, the 'silver bug.' An aged relation of mine has often described the species to me as being very well known; but, although he made every endeavour between thirty or forty years ago to obtain the larva for me, he found it was extinct. He himself, a grower of hops, was very observant, and his testimony is therefore of value.

"*Vanessa polychloros*.—Mr. Jenner says, 'Local and less common than formerly.' I have scarcely seen this insect in Sussex for thirty years; it was at one time common near Lewes, and my series was taken at Keymer.

"*Melanargia galatea*.—Mr. Jenner says, 'Local, near Lewes (formerly); Firle Beacon.' This is another singular case of the disappearance of a Lepidopteron once common near Lewes. At one time it appeared year after year at Oxsettle, near Lewes; I have not seen it there for over forty years. Mr. Auckland notes that this species was taken by him at Plashet Wood, Chailey, and Warningore Wood, in the beginning of June.

"*Pararge egeria*.—'Woods and shady lanes; not common, but generally distributed' (Jenner). This species is yearly becoming rarer. Mr. Stanton Hillman, of Lewes, informs me that he has not seen one for years. In my younger days it was common.

"*Lycæna ægon*.—'Local; Brighton, Hayward's Heath, Lewes, Chailey, Tilgate Forest' (Jenner). This insect was common at one time on Cliffe Hill, Lewes. I find in my notes that on June 8th, 1844, I took 15. Mr. Auckland notes it as found there during the months of July and August. It has now quite disappeared from that locality; I have not seen it there for at least forty years.

"With this I conclude my notes. As to the causes of the progressive rarity of the seven latter species mentioned I cannot hazard even a conjecture; but I feel tolerably certain that it has not been brought about by the entomologists, although in some instances man may be the cause, owing to the cultivation of the soil and the eradication of the food-plant of the species."

Mr. South said that, as Mr. Weir pointed out, *Aporia cratægi* very probably migrated here, occurred for several years, and then gradually disappeared. Mr. Tugwell said that he first saw *A. cratægi* alive some years since at Herne, a village near Herne Bay. His attention was attracted by a large white butterfly in an uncut grass field, and on entering

the field he discovered a pair of the species sitting on the grass stems *in cop*, and on looking round within a space of 25 yards he saw 20 or 30 such pairs, and took a good many of them; but on his going the next day, expecting to find the species on the wing, he failed to see a single specimen. Mr. Chaney remarked that *A. cratægi* was at one time very abundant near Rochester, and all over the Hundred of Hoo; in fact, commoner than *Pieris brassicæ*, and was to be taken on the wing, and also on the blades of grass; but the species had disappeared about the year 1871. *L. sinapis* used also to be common in a wood the other side of Chatham in the year 1856, but gradually became scarcer and scarcer, and about the year 1858 or 1859 disappeared altogether. Other species which were at one time plentiful in that district, but had since become extinct, were *M. athalia* and *L. sibylla*. The fact that *A. cratægi* was not found there now was very curious, as the species had been so widely distributed over a large tract of country, and the numerous food-plants were very abundant, and appeared throughout the neighbourhood. Mr. Carrington thought there was a general scarcity of butterflies all over England, and possibly Great Britain. His first experience of *A. cratægi* was in Yorkshire, in a rough place close to Stockton Forest, where it was very plentiful, and the same abundance was noticeable of *M. galatea*. In the year 1878 or 1879 there was a very severe winter, and the following summer both these species, with others, had utterly disappeared, and almost all the butterflies in the neighbourhood became so scarce that the local collectors had to get specimens from other localities to complete their series; and he felt certain that in the younger days of old collectors the butterflies occurred all over the country in numbers far exceeding anything that we know of now. Mr. Tutt said that, although he had never taken *A. cratægi*, he knew that in 1868 hundreds were captured near Chatham in a field used every month for a cattle fair, the larvæ being taken from the hedges surrounding the field. Mr. Frohawk mentioned that Mr. Wood, of Chatham, had told him a few years ago that he took the pupa of *A. cratægi* off the plum-trees in that district, and that the

species at one time occurred very commonly close to Strood station, and he believed it still occurred at Sittingbourne. Mr. Sheldon observed that, with reference to Mr. Carrington's remarks as to the severity of the winter he referred to being the cause of the present scarcity of butterflies, he was of opinion that it was a number of frosts and a number of thaws, each lasting a few days, which destroyed the pupæ of the different species, rather than a continued frost ; and he called attention to some experiments which had been made with the object of clearing up this point. Dr. Rendall remarked that *M. athalia* had been very abundant in Abbot's Wood during the past year.

FEBRUARY 10th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. H. Collings and Mr. L. F. Hill were elected members.

Mr. S. Stevens exhibited a remarkable variety of *Vanessa atalanta*, L., and a suffused variety of *V. io*, L., which he stated were both bred by Mr. Smith, of Birmingham.

Mr. R. Adkin exhibited *Spilonota incarnatana*, Hb., which, he remarked, was a species said to occur among Burnet Rose (*Rosa spinosissima*, L.) on the coast ; bred from larvæ taken in the heart of Surrey, forty miles from the sea, and although the accredited food-plant existed in some quantity in the locality, the bulk of the larvæ were found in shoots of Sweet Briar (*R. rubiginosa*, L.).

Mr. C. A. Briggs exhibited over 100 specimens of *Lycæna corydon*, Fb., including dwarfed forms, blue and brown forms of the female ; varieties of the underside, in some the spots being absent, in others in excess of the usual number, and in some cases running into streaks.

Mr. R. South exhibited species of British and foreign *Lycænidae*, and contributed notes, calling particular attention to a variety of *L. corydon* from Asia Minor, which, he said, as far as he could recollect, was similar to the males exhibited by Mr. Sabine at the Society's meeting on the 7th Oct., 1886.

Mr. Hall remarked that he had had an opportunity of examining Mr. Sabine's varieties, and thought they were very similar to the variety now exhibited. Mr. Tutt said he thought the specimen referred to was simply a very local form of *corydon*.

Mr. Kelsall, as a visitor, exhibited a living example of the black rat (*Mus rattus*), captured in Ratcliffe Highway, and stated that he understood the black rat was now very scarce in London, having been deposed by the Norwegian rat.

From the remarks of several members, it appeared that specimens of the black rat had been met with recently in several parts of London.

Mr. Cooper stated he had just received a specimen of the Peregrine falcon (*Falco peregrinus*, Tunstall), which had been shot at Brandon, in Suffolk.

Mr. Cockerell exhibited specimens of the following Mollusca:—*Succinea pfeifferi*, Rossm., and *Cochlicopa lubrica*, Mull., from St. Thomas, Ontario, Canada; and remarked that these species were also to be found very abundantly about London, and were distributed throughout the whole of Europe.

Mr. John T. Carrington communicated a paper on "Hibernation and Æstivation," in the course of which he said that before passing in review some of the orders most commonly known to hibernate, he would first call attention to the cause of this phenomenon. Experiments and observations proved that the torpid condition of hibernation was to be accounted for by the fact that respiration of the animals affected was regulated by the state of the activity of the muscular fibre. This activity was at rest in ordinary sleep, and when more "deadened" by cold or other influence, the respiration which would support actual vitality was brought to a minimum; hence the long winter's sleep known as hibernation. The period of this torpid condition was regulated by the susceptibility of the muscular tissue of various animals, and some which were looked upon as higher in organisation than others seemed more susceptible than those which were more frail when anatomi-

cally considered. Among the mammals of this country, hibernation was best exemplified in the winter sleep of the common hedgehog, and we got various conditions of hibernation until the habit was met with so slightly developed as in the hare, which slept in a partially torpid condition only during and after severe and cold snowstorms, in little cave-like hollows in the snow. During perfect hibernation all the vital functions were in abeyance. The temperature of the bodies of hibernating animals being nearly the same as that of the surrounding atmosphere, the whole winter sleep was greatly affected by temperature. After treating of the hibernation of many species of mammals, fishes, and reptiles, the antithesis of hibernation, known as *æstivation*, or the retirement in hot countries during great summer heat and long-continued drought of large numbers of animals, with almost identical appearances as in hibernation, was then described; and the case of an animal allied to the common hedgehog, inhabiting Madagascar, that *æstivated* for three months during the sub-tropical summer, in burrows, just as our small spiny friend hibernated during the winter months in Europe. Many tortoises, crocodiles, and serpents, also most land mollusca in hot countries, were said to *æstivate*. During the heat of tropical India, large numbers of fish were in the habit of retiring under the mud of their native pools as the water evaporated, and in that condition could remain apparently for an indefinite period; for ponds which had been dry for several years were found crowded with fine fish on water being again admitted, and softening the hard cake of mud which enveloped them. Animals which had been brought to Europe from the tropics, and which were in the habit of *æstivating* at home, generally *æstivated* in the colder climate at the proper season. This indicated that some other influence than cold or heat induced these periods of sleep, though certain temperatures necessarily favoured the conditions. Neither abnormal heat nor abnormal mildness would stop hibernation or *æstivation* respectively in some animals which were subject to their influences; when the time came round for the periodical rest, sleep they must. It did not appear to be

generally known that those animals which were subject to either hibernation or æstivation appeared to retire at intervals during their active life for a shorter sleep of, say, a couple or more days. Dormice did this, as did the hedgehogs, and probably many insects did the same. This habit was known as diurnation, or day-sleep, and appeared to be little understood. It must not be confounded with the retirement of land-shelled molluscs for the growth of the shell covering, as was their custom. In the vegetable world each of these periods of rest occurred. Most seeds either hibernated or æstivated, as did trees, by losing their leaves and by the downflow of the sap. To what extent seeds might be affected was doubtful; but there was no doubt vegetable life might be kept in abeyance for long periods by prolonging the condition of hibernation artificially. The pupæ of insects often laid over in that stage of their existence for three, four, or more years, thus hibernating the whole time as it were. This might to some extent account for special seasons of exceptional abundance and consequent destruction of vegetation by these unwelcome guests, which had only been remaining in reserve in one stage or other of their metamorphosis until a favourable event caused their emergence in abundance.

FEBRUARY 24th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. J. E. Kelsall, Mr. J. Lee, and Mr. E. B. Nevinson were elected members.

Mr. Tutt exhibited long series of *Tephrosia crepuscularia*. Hb., from Hungary, and remarked that he was unable to obtain any forms of *T. biundularia*, Bork., from that country, although he had received it from Germany. Mr. Tutt further showed specimens of Continental *Agrotidæ*, and, for the purpose of comparison, British forms of the same species. Also Continental *Acidalia perochraria*, Fisch., which he stated appeared in the British list of Lepidoptera, but on what authority he did not know. To him the specimens exhibited looked like intense forms of *A. ochrata*, Scop.

Mr. Tugwell said that Mr. Sidney Webb, of Dover, had in his cabinet British specimens of *perochraria* which had been taken by the late Mr. Weston near Merstham, Surrey.

Mr. R. Adkin exhibited specimens of *Notodonta ziczac*, L., *Dianthæcia capsophila*, Dup., *Aplecta prasina*, Fb., and *Eupithecia pumilata*, Hb., from Co. Cork, with examples of each of the species from the London district for comparison; and pointed out that in all those from Ireland the markings were less clearly defined, and the general appearance of the insects duller and more suffused, than in the English examples.

Mr. Tugwell exhibited a dwarfed form of *Lycæna icarus*, Rott., and English and Scotch forms of *L. icarus*.

Dr. Percy Rendall exhibited land and fresh-water shells, including *Helix aculeata*, Mull., *H. pisana*, Mull., *H. virgata*, Da Costa, *Pupa umbilicata*, Drap., etc.

Mr. Cockerell exhibited *Succinea putris*, L., subsp. *S. parvula*, Drouet, a small species of the "*putris*" section of the genus, not previously recorded as British, collected by Mr. J. H. James at St. Columb, Porth, Cornwall; also *Pisidium roseum*, Scholtz, from Putney, which he stated was not supposed to be a rare species, although not generally recognised when met with.

Mr. J. Jenner Weir read the following paper on "Melanism."

"I have read and carefully studied Mr. Dobree's very instructive paper on this subject, which appeared in the February number of the 'Entomologist,' pp. 25-28.

"So far as my limited knowledge extends, there is no connection between the tendency to melanic variation in Lepidoptera and the high latitude they may have been produced in; but, on the contrary, I find that, so far as the Lepidoptera of Russia in Europe are concerned, of the 300 species I have received from the neighbourhood of St. Petersburg, from the late Mr. Field and Mr. Ersthoff, none show the slightest melanism.

"I am not, however, disposed to think that this fact 'destroys Lord Walsingham's latest and ingenious theory on this subject,' as Mr. Dobree states, but modifies it, and con-

finer the phenomenon to the higher latitudes of the British Isles, and to high altitudes.

“ Lord Walsingham’s theory of melanism in Lepidoptera was embodied in his address as President of the Yorkshire Naturalists’ Union, delivered on 3rd March, 1885, and was commented upon by me in the ‘Entomologist,’ Vol. xviii., pp. 81-87, to which I beg a reference.

“ It appears to me that Mr. Dobree has misunderstood Lord Walsingham’s theory of melanism, viz., ‘that a large expanse of white snow tends to produce it.’ Such was not my reading of the author’s theory in 1885.

“ I have refreshed my memory, and carefully re-read the address; and, as I understand the theory put forth, it was, shortly, that the dark coloration of Lepidoptera from both high latitudes and altitudes was of service to them, because, in such localities, ‘they require rapidly to take advantage of transient gleams of sunshine’ (*vide* p. 10 of the Address).

“ I have myself travelled in the Netherlands, Belgium, France, Germany, Switzerland, the Tyrol, Bohemia, Spain, and Italy; and in all these countries, except in the mountains, I have been struck by the extreme clearness of the atmosphere. In Bohemia, Italy, and Spain I found this to be the case in the greatest degree—in fact, in Bohemia I found, to my sorrow, one very hot day, that the town I could plainly see, and which I thought to be but four miles distant, was sixteen.

“ In the mountains of Switzerland and the Tyrol the clearness of the atmosphere was nearly as great, but constantly interrupted by dense mists and clouds; and it is precisely in these altitudes that melanism becomes rather the rule than the exception; many of the topomorphic varieties are melanic, and many of the Alpine species are very dark. *Pieris rapæ* var. *bryoniæ* may be given as an example of the former, and the male of *Melitæa cynthia* of the latter.

“ This uncertain condition of the weather is characteristic of the climate of the British Isles; the result is, that our indigenous Lepidoptera are, as a rule, darker in colour than the Continental; and the tendency to melanism increases northwards, till it may be said to culminate in the Shetlands.

"If I am correct in my views—and I think the facts I have brought forward are in accordance with Mr. Dobree's—then it follows that in the British Isles and in the mountains of Europe it is essential to the imagines of Lepidoptera that they should rapidly take advantage of transient gleams of sunshine, and this the darkening of their coloration enables them to do.

"I have myself seen *Vanessa urticæ* fall helpless in its flight when the sun passed behind a cloud in spring; and in the wet summer of 1879 the rapidly-flying *Argynnis paphia* was easily captured with the fingers, having taken refuge in the brambles when disturbed, because it was unable to fly. If this occurs in the south of England, it would be much more likely to occur in the more northern parts of these islands, and in the Alps.

"In conclusion, I cannot but express my admiration of Mr. Dobree's excellent paper, which is a most valuable addition to the literature of melanism."

Mr. George Smith, of the Sciopticon Company, then gave an exhibition of photo-micrographic lantern slides, being photographs of the enlarged image of the microscopic object printed from metal plates by the Woodbury process, the negatives having been furnished to the Company by Mr. F. H. Evans. The slides were thrown on a three-foot screen by means of the "Sciopticon" lantern, which was fitted with a dissolving apparatus for the purpose of changing the slides. The objects were illuminated by reflected, transmitted, or polarised light, and were remarkable for the extraordinary depth of focus obtained in the photographic negative. A large number were opaque objects, and among the most interesting slides were diatoms *in situ* on coralline; *Arachnoidiscus ornatus*; groups of the Foraminifera; *Polycistina*; *Ceratospyris ateuchus*; sponge spicules, *Echinus* spines, and examples of the class *Asteroidea*; spinnerets and jaws of the garden spider, *Epeira diadema*; parasites of the cat, horse, sparrow, humble bee, ox, elephant, etc.; *Cecidomyia pectoralis*, *Anagrus incaratus*, *Cynips terminalis*; spiracle and eye of *Dysticus marginalis*, L.

MARCH 10th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. D. J. Rice and H. H. Druce were elected members.

Mr. T. R. Billups exhibited specimens of an exotic Ant, *Tapinoma melanocephalum*, For., taken by him September, 1886, in the Palm House, Kew Gardens, on a species of palm (*Howea griesbachia*) from Tropical Australia. He remarked that the species was first described by Forel from Cayenne specimens. Since then the insect had been received from the Tonga Islands, and recently from Bahia and St. Thomas. Examples had also been met with in India, Oceania, Tropical America ; and Forel found the ant on board one of the West Indian mail steamers ; but this is the first recorded capture of the species in Europe. The number of exotic ants found in Kew Gardens by Messrs. Smith, Saunders, and himself was by this addition raised to seven species.

Mr. R. Adkin exhibited *Zanclognatha tarsipennalis*, Tr., and read the following note :

"From a Moth taken at Chobham on July 15th, 1886, I obtained ova which hatched on the 24th. Being desirous of quickly feeding up the seven young larvæ that were produced, they were placed upon knotgrass in a bottle, which was kept indoors. By October 8th one had fed up and pupated, and the imago emerged on the 30th of that month ; the remainder did not, however, appear to be fully grown ; and as they had made slight webs among moss that had been given to them, I concluded that they would hybernate, so, having placed them, moss and all, in a flower-pot with a small growing plant of bramble and some low plants, they were put out in a shed in the garden. No further notice was taken of them until March 1st, 1886, when the only larva visible was still in its web. On May 16th, six larvæ were still alive, and on 18th one had turned to pupa, and the last, two having died in the meantime, pupated early in July. The imagines appeared on June 16th, 17th, July 15th and 22nd respectively ; the last

having been but two days short of twelve months in passing from the egg to the perfect state."

Mr. J. W. Slater exhibited two specimens of *Arctia caia*, L., with yellow hind wings, which he stated were bred, together with eight others, by Mr. Mutch, of Hornsey. A number of larvæ, obtained early last season, were fed, some on low plants, and others on leaves of the lime tree. The latter produced imagines of a colour quite different from that of those fed on the low plants. He should mention that Mr. Mutch is engaged in carrying out experiments of this kind; feeding larvæ on different food plants, and observing the effect produced, with a view to throwing some light on the genesis of colour. Mr. Adkin remarked that it was a much vexed question whether food had any effect on the colour. Mr. Wellman mentioned that he had bred numbers of *A. caia*, but had never succeeded in getting many varieties. Mr. South said that, with the view of rearing varieties of this species, he had tried feeding the larvæ on all kinds of plants, and had never yet succeeded in breeding any but typical *caia*; he had also tried feeding under various coloured glass, and in darkness, but with the same result. On several occasions, however, when he had picked up larvæ in the lanes, and had taken no trouble with them, he had bred some curious forms. Mr. Jenner Weir recollected reading of some very curious varieties having been obtained by feeding the larvæ on the onion, which seemed a strange kind of food. Mr. Tugwell said his experience was very similar to that of Mr. South. Mr. Carrington thought that if the larvæ of *A. caia* were fed from the egg there would be some difficulty in feeding them on lime, a tree which came into leaf late in the season, unless it happened to be a second brood, and it was well known that second and third broods of the species generally emerged smaller and usually very dark. Mr. Hall suggested it would be much more interesting if gentlemen undertaking these experiments were to exhibit the whole series instead of single specimens. Mr. Cockerell said it was singular that there should be a yellow form of most red species found throughout almost the whole of the Animal

Kingdom ; there was a yellow variety of most red shells, and yellow varieties of the *Zygænidæ*. It would seem that the red and yellow pigments were closely associated ; one would almost suppose one was merely a form of the other. Mr. Weir said that if redpoles were bred in confinement, the red colour of the head became yellow.

On behalf of Mr. C. A. Briggs, Mr. Carrington exhibited hybernating specimens of *Helix pomatia*, L., and stated that he once found this species in large numbers at Box Hill just coming out from hybernation. Those shown to-night were very dark, and were probably not British, which were generally larger and yellower. Mr. Weir remarked that the colour would depend on the geological formation ; he once had some very light specimens in his garden at Blackheath, and succeeded in getting a brood, and the shells of those bred there became very much darker, which he attributed to the smoke of London. Mr. T. D. A. Cockerell said the species in England was confined to the chalk, while on the Continent they were found more generally distributed.

Mr. E. Step read a paper upon "Mosses," of which the following is a brief summary. Taking the Common Hair Moss (*Polytrichum commune*) as a convenient type, he pointed out the general characters of root, stem, leaf, and fruit, their structure, and the generic and specific variations of these. Then, proceeding to the more important subject of reproduction, the fructification of *P. commune* was shown and described. At the summit of its stem *P. commune* bears a shaggy, extinguisher-like body (*calyptra*), beneath which is a squarish box, or urn. The calyptra removed, we find the angular box, or capsule, as it will be well to call it, is surmounted by a sort of lid (*operculum*), with a handle-like process in the middle. When the moss-fruit is ripe, the expansion of the capsule forces off the *calyptra*, and soon the lid follows. Whilst this has been going on the capsule has been losing its erect character, and gradually assuming a position at right angles to the long fruit-stalk. We can now see that the top of the capsule is a finely-ribbed ring, within which is stretched a thin membrane. Now this ribbed ring really consists of a

large number of blunt teeth bent over towards the centre of the mouth of the capsule. In consequence of their disposition round the mouth, the collective name of *peristome* has been bestowed upon them.

This peristome is not present in all mosses ; in certain genera it is always absent. But the majority of mosses possess it, and the character of the teeth is important in distinguishing various species. If the peristome is breathed upon, and viewed with a lens, the whole of the teeth will be seen to gently raise themselves until they stand in an erect position round the mouth of the capsule, and form a coronet.

A vertical section through the capsule will reveal a central pillar (*columella*), supporting a disc which accurately fits the mouth of the capsule and protects the tiny spores contained in the capsule beneath it. Those spores are individually almost invisible, but each one is capable of giving rise at length to a moss-plant, similar to that which produced it.

We have seen that warmth causes the peristome to erect itself ; and this seems to give us the clue to its use. It is composed of two separate layers of cells, each layer having hygroscopic properties differing from those of the other, so that when subjected to the influences of cold damp air the teeth close in and protect the spores ; but when the air is dry and warm they open out, and at the same time the columella lengthens and the disc is pushed up to a level with the tips of the teeth, so that the light spores are enabled to pass out between the teeth and get scattered by the wind. If the teeth opened in damp weather the spores would either drop out and fall upon the spot already occupied by the mosses, or they would cake together in the urn and refuse to come out. But opening when the atmosphere is dry, they fall out so finely divided that the slightest movement in the air will carry them to great distances, and keep them long suspended. But should the breeze carry them over moist surfaces, many of them will become attached and soon will germinate.

When the spore has absorbed sufficient moisture, the outer of its two envelopes bursts, thus allowing the inner one

to send out a tubular shoot, which, as it lengthens to form a rootlet, becomes divided by transverse partitions. Another shoot runs along the surface of the ground, and soon divides into two branches, which subdivide again and again, until, mingling with the similar branches from other spores, a felted mass of green hairs is formed. The next step in the building up of a moss is seen when small protuberances make their appearance on these hairs. Whilst these nodules are developing into buds, they are also sending minute rootlets down into the soil. The buds lengthen, and soon assume the character of a growing stem, clothed with leaves, and in due time terminated by the shaggy cap, which we saw on the parent plant, with the spore-urn beneath it.

In the Bog Mosses (*Sphagnum*) there is a slight difference, for instead of the bursting spore producing a slender thread, it broadens out to a little green scale, like a tiny liverwort, and from notches in its margin produces the buds which ultimately grow into the complete sphagnum plant, crowned by a number of the pretty red capsules, which in this order are always globular, and with the peristome entirely wanting.

Sometimes we may find specimens of the Hair Moss in which the summit of the stem does not bear a spore-capsule; instead, it ends in an expansion of pale-coloured leaves, which assume the form of a rosette. These particular leaves are very short and broad when compared with the lower leaves; there are several rows of them, and those of each succeeding circlet are smaller, until we reach the centre, where instead of leaves there are several club-shaped bodies called *antheridia*. These, when mature, are filled with a mucilaginous fluid, in which are an enormous number of little cells. The summit of the antheridium splits across, and the fluid with the cells pours out. Individually examined, these cells are seen each to contain a minute coiled-up organism, which may be roughly likened, as regards form, to a tadpole with a tail of great length ending in two long cilia. By the constant lashing of this tail, it frees itself from the mother-cell in which it originated, and swims through the surrounding fluid.

The history of the spore-capsule is, shortly, as follows.

Within a cluster of leaves at the tip of a moss-stem there was an organ (*archegonium*) somewhat similar to the pistil in some flowering plants. It consisted of a swollen portion near the base, surmounted by a long cylindrical body, perforated throughout by a narrow canal, which, when it reached the swollen portion, enlarged into an oval cavity. The tadpole-like bodies, which are distinguished by the name of *antherozoids*, find their way in at the upper end of this canal, and so into the oval cavity, where, by mingling with the contents (*oosphere*), they fertilise them. As the result of this process the oosphere (which is henceforth known as the *oospore*) assumes a spindle-shape, and increases in size. In time it develops a stalk from its lower end, and the growth of this tears away the upper walls of the archegonium-cavity, which ultimately become the calyptra. The oospore enlarges under the calyptra, and its interior becomes filled with the minute dust-like spores, which form around a central pillar—the *columella*.

As the capsule ripens, the upper portion becomes partially separated from it, and assumes the form of a lid to the vessel. We have seen that this lid (*operculum*), following the calyptra, is cast off when the spores are ripe, and the circle of teeth (*peristome*) then commences its work of distributing the spores.

“The time necessary for the formation of the capsule varies greatly in the different species, but is usually very long in comparison with the small size of the body concerned. The Pottiæ blossom in summer, and ripen their spores in the winter; the Funariæ are perennially in blossom, and have constantly sporogonia in all stages of development, each occupying for its completion probably two to three months. *Phascum cuspidatum* develops in the autumn, and ripens its spores in a few weeks before the winter. The bog *Hypna*, on the other hand, blossom in August and September, and ripen their spores in July of the next year; they often require ten months for the development of their capsules. *Hypnum cupressiforme* bears in autumn, at the same time, sexual organs and ripe spores, and hence requires one year. The

same length of time is required by *Philonotis*, and by some species of *Bryum* and some of *Polytrichum*, which blossom in May and June."*

The capsule is usually borne on a long slender footstalk, but in some species this is partially or entirely suppressed, the capsule peeping out from the enfolding leaves, as in *Daltonia*, *Cinclidotus*, *Diphyscium*, *Fontinalis*. Some species of *Grimmia*, when the capsule is full grown, hide it among the foliage. Though the general form of the capsule is more or less ovate, in *Bartramia* and *Phascum* it is spherical, in *Tortula* it is narrower, and of greater length; in *Polytrichum*, as we have seen, it is quadrangular, and in *Funaria* pear-shaped. The teeth of the peristome are *always* some multiple of 4—8, 16, 32, or 64—usually 16 or 32 in number.

Then, too, we should not omit to observe that the method by which the capsule opens is not in all species the same as we have described in *Polytrichum*. *Sphagnum*, for instance, opens by simply casting off the operculum; there is no peristome. The species of split mosses (*Andreaea*) have a lid to the capsule which does not separate from it; instead, the capsule opens by means of four slits in its walls, which extend almost to the base and the summit. In dry weather these slits open wide, and in damp weather close up. There is no peristome here. In the earth mosses (*Phascum*), again, there is no peristome; and the capsule does not open, the spores being liberated only by the decay of that organ.

There is also great variety in the size of the spores. According to Schimper, the spore of *Archidium* is $\frac{1}{5}$ th of a millimetre in size, and only sixteen spores are found in each capsule; whereas in *Dawsonia* the measurement of each spore is scarcely $\frac{1}{200}$ th of a millimetre. As a rule, the smaller the species of moss, the larger are the spores produced by it. Some of these spores, when sown under favourable conditions as regards the dampness of the soil, germinate in two or three days, and produce, first, the green felt-work, from which in about three weeks the true stem, clothed with leaves, begins to arise. This is true of *Funaria*, *Gymnostomum* etc.; whilst

* Klinggräff, quoted by Sachs.

those of *Sphagnum* do not germinate for two or three months. Should soil and atmosphere remain dry for some time after the spores have been sown, their germination will be so long postponed.

The concluding portion of the paper was chiefly concerned with the habitats, distribution, culture, and æsthetics of the moss-tribes.

MARCH 24th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. J. Stringer and J. W. Slater, F.E.S., were elected members.

Mr. Billups exhibited two rare species of Ichneumonidæ, the first being a male of *Stilpnus deplanatus*, Gr., which he bred from a larva case of a species of *Psyche*, found attached to the fence of his garden. The other species was *Apanteles tetricus*, Reinh., which he had reared from the bloom of the Common Thrift, or Sea Pink (*Armeria maritima*, Auct.). He stated that this rare species of Braconidæ, according to the Rev. T. A. Marshall, had hitherto only been recorded from Devonshire, where Mr. Bignell had reared two broods of six and seven respectively from the larvæ of *Epinephele ianira*, L. The Rev. T. A. Marshall also found a batch of about thirty cocoons attached to grass, near Teignmouth, where the larvæ of *Zygæna filipendulæ*, L., were very plentiful, one of which was most probably the host of the little *Apanteles*. Mr. Billups further stated that he was indebted to the kindness of his friend Mr. South, who presented him with the blossom which was collected in the Warren, Folkestone, for this rare addition to his collection.

Mr. Cooper exhibited a species of Ichneumonidæ: *Macrocentrus marginator*, N. sp., bred from a pupa of *Sesia sphegiformis*, Fb.

At the close of the ordinary business there was an exhibition of microscopical objects; Mr. Tutt showing wings of Lepidoptera, prepared and mounted by Mr. Coverdale and himself; Mr. W. West (Streatham), eyes of spider and other subjects; Mr. Medland, proboscis of blowfly, etc., also an

adaptation of the electric light for microscopical and surgical purposes.

Mr. Dadswell and Mr. Macer, who were present as visitors, also exhibited, the former botanical, and the latter entomological objects.

APRIL 14th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. C. A. Briggs exhibited a large number of *Lycæna bellargus*, Rott., including many forms of the male and female, dwarfed forms, and some remarkable varieties of the under side; also a pale yellow variety of *L. ægon*, L., and varieties of the under side of *L. icarus*, Rott., and *L. astrarche*, Bgstr., of which the following were the most important:—

Var. of *L. (astrarche)* *medon*, U. S.

Ground colour of all the wings pearly white, shaded in parts with pale ash colour. The marginal row of red spots very bright and distinct, owing partly to the absence of the usual outer row of black dots.

Except the central spot on each fore wing, and three spots—of which two are very minute—on each hind wing, the usual black spots are entirely absent.

The specimen was captured near Dover in 1878.

L. icarus ♂, U. S.

Very similar to the preceding. All four wings pearly white, shaded in parts with dark grey. All the black spots absent, except the central one in each wing. The red marginal band of spots normal, the row of black points outside them in the fore wings very faint, and the inner crescentic row unusually strongly marked.

Captured near Dover in 1879.

Mr. Goldthwaite exhibited living larvæ of *Pericallia syringaria*, L.

Mr. R. Adkin exhibited several pupa cases of *Eupæcilia ambiguella*, Hb., from the New Forest, and commented upon their similarity to the bark of the twigs and stem of the Alder Buckthorn (*Rhamnus frangula*), to which they were attached.

Mr. T. R. Billups exhibited the following exotic Coleoptera : *Megalosoma elephas*, Fab., from Guatemala ; *Xylotrupes gideon*, L., Java ; *X. dichitomas*, Fab., Philippine Isles ; *Chalcosoma atlas*, L., Philippine Isles ; *Archon centaurea*, Burm., Guinea ; *Golofa hastatus*, Burm., Mexico ; *G. eacus*, Burm., S. Columbia ; and *G. porteri*, from same locality ; also three specimens of the rare Lamellicorn, *Phæneus imperator*, Chev., from Chili. Mr. Billups also contributed the following interesting remarks in relation to his exhibit. The species of Lamellicorn Beetles shown belong to the family Dynastidæ, comprising some of the largest and handsomest of the beetle race, mostly inhabiting tropical regions, there being no English representative, although one species, *Oryctes nasicornis*, which is common on the Continent, is classed among the British Coleoptera. According to Lacordaire, the habits of the Dynastidæ were very similar, being seldom seen in the daylight, concealing themselves during the day, or at most, crawling in the depths of the woods. They came from their hiding places during the night, and flew about the trees, as Lacordaire thought, in search of food ; but Mr. Billups thought Professor Westwood was more correct, his view being that they were in search of their mates. It was curious that, as the British Rove Beetles were sometimes found in ants' nests, so some of their monster exotic relatives were found in similar places.

Mr. E. Step exhibited a living example of the Slow Worm (*Anguis fragilis*) from Leith Hill, and made some remarks in reference thereto. Dr. Rendall asked whether this species had any means of reproducing its tail after it had been shed or broken off. Mr. J. J. Weir, in reply, said he had no positive proof as to the Slow Worm, but he once found an example of the Scaly Lizard (*Zootoca vivipara*) which had but a stump for a tail. He had kept it, and it had now produced as long a tail as he had ever seen ; he was pleased to be able to prove this by actual experience, as not long since a doubt had been thrown on the subject in *Science Gossip*.

The Secretary read a letter from Mr. W. F. de V. Kane, containing a communication from an Indian correspondent as to

the capture in the Gerakphur Woods, India, of a large black moth—either a Geometer or a slender-bodied Bombyx—which produced a curious crackling noise when flying; the species did not come to light, and was quite invisible when flying. There was also a note as to the abundance of Emerald Moths in the same woods.

Mr. T. D. A. Cockerell read a paper on "Variation," printed in full at page 95.

APRIL 28th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. P. Russ was elected a member.

Mr. Helps exhibited a specimen of *Deilephila livornica*, Esp., from Coles Cross, near Crewkerne.

Mr. Lea exhibited *Pachnobia leucographa*, Hb., and other species taken in Herefordshire at Sallow.

Mr. South exhibited a male *Lycæna corydon*, Fb., and called attention to the distinct black discoidal spot on the fore wing; also a specimen of *Zygæna* from Folkestone, which he thought might probably be a hybrid between *filipendulæ*, L., and *trifolii*, Esp., as it had the characters of the last-named species on the upper surface, but beneath it was more like *filipendulæ*.

Mr. J. Jäger exhibited *Eupithecia pumilata*, Hb., bred from flowers of Clematis (*Clematis vitalba*, L.) and Hemp Agrimony (*Eupatorium cannabinum*, L.).

Mr. S. Edwards exhibited *Papiliomerope*, Cram. (♂ and ♀). Mr. Jenner Weir remarked that Mr. Edwards' exhibition of *Papilio merope*, Cram., and the two species or sub-species, *P. cenea*, Stoll, and *P. meriones*, Felder, was of great interest. The males of the three from Western Africa, South Africa, and Madagascar respectively, were exceedingly alike, yellow and black swallow-tailed butterflies; but whilst the female of *P. meriones* differed but little in colour, and not at all in shape from the male, each of the others had females without tails, and of quite a different shape from the males. As to colour, some of those exhibited of the true *P. merope* were black and white, closely resembling *Amauris niavius*, L.; another

was red and black, marked as, and closely resembling, an *Acræa*. The females shown of the South African sub-species (*P. cenea*) were equally varied. Some mimicked *Amauris dominicana*, Trimen, and another *Nebroda echeria*, var. *albimaculata*, Butler, being respectively black and white, and black, yellow, and white. Then there was a singular female, in which the upper wings were like *Amauris dominicana*, Trimen, whilst the under wings were ochreous, and looked more like those of an *Acræa*. It was as if Nature was halting and hesitating as to which species should be mimicked.

Mr. T. R. Billups exhibited the following exotic Coleoptera of the family Lamellicornes, or Leaf Horned Beetles, of the sub-family Scarabædiæ, amongst which were many rare and beautiful forms of the Genus *Phœnus*, *Onthophagus*, *Gymnopleurus*, and *Sisyphus*, the most noticeable being *Phœnus festivus*, L., *P. splendidulus*, Fab., *P. sapharinus*, Sturm, and *P. principalis*, Dup., all from Brazil; while *Onthophagus gazella*, Fab., from the Cape of Good Hope, *O. capella*, Kirby, from New Holland, and *O. tages*, Oliv., from Hispania, with *Gymnopleurus amœnus*, Boh., from Port Natal, were remarkably fine specimens; also living British specimens of *Rhopalomesites tardii*, Curt., from Monaghan, Ireland.

Mr. T. D. A. Cockerell exhibited specimens of the following Mollusca: *Limax agrestis*, L., and var. *sylvatica*, Moq., *Amalia gagates*, Drap., var. *plumbea*, Moq., and *Arion bourguignati*, Mabille, found by Mr. T. R. Billups in lettuces received from Cherbourg.

Mr. J. E. Kelsall read a paper on "British Bats."

MAY 12th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. H. J. Turner, F. G. Fenn, and C. H. Morris, were elected members.

Mr. J. A. Cooper exhibited bred examples of *Aleucis pictaria*, Curt., *Macaria alternata*, Hb., *Asphalia ridens*, Fb., etc.

Mr. T. D. A. Cockerell exhibited the following mollusca : *Arion ater*, var. *glauca*, Colbeau ; *Arion ater*, var. *succinea*, Moq. ; *Arion ater*, var. *rufa*, L. ; *Arion hortensis*, Fer. ; *Arion subfuscus*, Drap. ; *Arion bourguignati*, Mab., found by Mr. George Roberts in his garden at Lofthouse near Wakefield ; *Scalaria pseudo scalaris*, Broc. from Mogador, collected by Mr. J. H. Ponsonby, which he stated might now be considered conclusively established as British, as six specimens had been found in recent years from widely different localities, viz., Scilly, North Devon, and Kent ; Miss Fair of Faversham had collected the six specimens referred to.

Also the following species found by Mr. T. R. Billups among lettuces from St. Malo :—*Arion ater*, var. *rufa*, L. ; *Arion subfuscus*, Drap., *Limax arborum*, B-Ch., *Limax agrestis*, L., *Limax agrestis*, var. *sylvatica*, Moq.

Mr. Kelsall exhibited an example of the Palmated Water Newt (*Lissotriton palmipes*, Bell.) and stated it was the rarest of the three newts found in Great Britain ; the females of the species shown were much easier to catch than the males. Mr. Billups said he once took a female specimen among water cress at Wallington, Surrey. Mr. Weir remarked that if the species were fished for with a worm it was possible to get as many males as females.

Mr. R. South exhibited the Snake's Head Lily or Fritillary (*Fritillaria meleagris*, L.) found at Pinner, Middlesex.

MAY 26th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. W. J. Holmes was elected a member.

Mr. T. R. Billups exhibited the following Hymenoptera, viz., *Cheiropachus quadrum*, Fab., *Blennocampa aterrima*, Klug., *B. alternipes*, Klug., and *Allantus marginellus*, Pz., and read the following notes :—

"*Cheiropachus quadrum*, Fab., a species of Chalcididous Hymenoptera, taken at Hayling Island, July last. This beautiful species is most probably parasitic on wood-

boring beetles, although Thompson refers it to the coleopterous genus *Colon*.

"*Blennocampa aterrima*, Klug., a very rare species of Tenthredinidæ, taken at Cobham in June last on the bloom of Solomon's Seal (*Polygonatum multiflorum*), which was growing in profusion on the bank of the railway. This species of sawfly has not, I think, previously been found in this country since the time of Curtis, when it was taken at Putney by the present Earl of Ripon. Cameron gives as the food plant of the larvæ, *Convallaria multiflora*, and *C. polygonata*, and the continental range, Sweden, Holland, France, Germany, Italy, and Russia.

"*Blennocampa alternipes*, Klug., another rare species, was first taken by myself at Loughton, in Essex, by sweeping, and was described by Mr. Cameron in his monograph of British Phytophagous Hymenoptera, Vol. 2, page 220. I again met with it in Headley Lane, Mickleham, in May last, on the wild raspberry, on which the larvæ feed, eating holes from the underside of the leaves. Its continental distribution is Sweden, Germany, and France.

"*Allantus marginellus*, Pz., taken on Hayling Island, in July last, on the flowers of the Water Parsnip (*Sium latifolium* and *S. angustifolium*), on each of which it seemed equally plentiful. Cameron speaks of this species as being somewhat rare in this country. Mr. Smith found it in the London district. Stephens records it from Coombe Wood and Norfolk. Mr. Dale records it from Glanville's Wooton and Whittlesea Mere, and Mr. Bignell has found it at Plymouth. At S. Hayling I might have taken hundreds. Its continental distribution, as given by Mr. Cameron, is Sweden, Germany, Switzerland, Italy, and Russia."

Mr. Cooper exhibited *Spilosoma menthastri*, Esp., bred from pupæ obtained in the vicinity of Glasgow, and differing from our southern form in having the ground colour of a buffish yellow, very pronounced in some specimens. In all, the black spots on the upper wings were more or less elongated, forming streaks, and in some cases joined together, giving a netted appearance. They appeared to come from a local

race, every specimen having some trace of this peculiarity of marking.

Mr. S. Edwards exhibited twenty-nine species of *Papilio*, including *P. ascolius*, Feld., *P. ædipus*, Gray, *P. marchandii*, Boisd., *P. sarpedon*, L., *P. hippodamus*, Feld., *P. cloanthus*, Westw., *P. agamemnon*, L.

Mr. T. R. Billups exhibited, and made the following remarks upon, the under-mentioned species of Coleoptera :—

Living specimens of *Carabus auratus*, L., found in the Borough Market, in baskets of radishes from the south of France ; this being the sixth year in succession that it has been found in London.

Cetonia floricola, Hbst., also living, found in a basket of Paper White Narcissus, from Bordeaux.

Blaps mortisaga, L., also from the Borough Market, being found in a box of Jaffa oranges, from Jaffa or Joppa, in the Holy Land. The Egyptian women are very fond of the larvæ of this curious beetle, which are roasted and eaten by them, and considered a great delicacy.

Mr. D. J. Rice exhibited the egg of the cuckoo (*Cuculus canorus*, L.) found in the nest of the hedge sparrow (*Accentor modularis*, L.), at Leith Hill, May 14 ; also eggs of Ring Ouzel (*Turdus torquatus*, L.) and Wryneck (*Jynx torquilla*, L.)

JUNE 9th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. H. E. Barren was elected a member.

Mr. T. R. Billups exhibited a number of living specimens of *Apanteles zygænarum*. Marsh, with their cocoons, which were of a pale sulphur-yellow. They were bred from the larvæ of *Melitea aurinia*, Rott. This rare species was first described by the Rev. T. A. Marshall, in his monograph of British Braconidæ, from two females and four males bred by Mr. Bignell from *Zygæna filipendulæ*, L. Mr. Billups also called attention to three specimens of the hyper-parasite, *Hemiteles fulvipes*, Gr., which he had reared from the same

batch of cocoons. The larvæ of *M. aurinia* were from Gloucester.

Mr. West (Greenwich) exhibited on behalf of Mr. Beaumont three fine varieties of *Abraxas grossulariata*, L.

Mr. R. Adkin exhibited, on behalf Mr. L. Gibb, a living larva of *Apatura iris*, L., recently beaten from Sallow near Brockenhurst.

Mr. A. W. Mera exhibited bred examples of *Fidonia limbaria*, Fb., and *Eupithecia venosata*, Fb., the latter having been two years in pupa.

Mr. T. D. A. Cockerell exhibited a number of larvæ found in flour in one of the London dock warehouses, together with some of the infected flour, and stated that there was very little doubt that the larvæ came from Trieste; the flour having been originally shipped from America to that port, and thence to London. It was now so full of larvæ that it was perfectly useless.

Mr. R. Adkin suggested that probably the species would turn out to be *Ephestia kühniella*, Zell., a warehouse pest that had recently been recorded from Stoney Stratford, Bucks.

Mr. T. R. Billups exhibited a species of Diptera, *Scatophaga lutaria*, Fab., in the act of destroying its victim, *Lucilla cæsar*, L. *Lasioderma testaceum*, L., a very destructive little Coleopteron, belonging to the family *Ptinidæ*, whose larvæ drill holes in furniture, old cabinets, and all sorts of vegetable substances, if dry. This exhibit consisted of a larva and three imagines taken from two cigars, a portion of a consignment of 7,000 from Calcutta, the whole of which were completely destroyed by the riddling of these little pests. The ginger root from the East Indies, Mr. Billups said, was particularly liable to the attacks of these insects; in fact, the importers calculate their loss annually at upwards of £3,000 on ginger from Cochin and Calicut alone. Also a number of specimens of *Pelophila borealis*, Pk., just received from County Armagh, Ireland, and taken by the Rev. W. F. Johnson.

Mr. Billups drew attention to the fact that at the

Society's Meeting of Nov. 4, 1886, he exhibited some miniature cocoons from some species of larvæ mining the leaves of a plant of Columbine (*Aquilegia vulgaris*, L.) There were three distinct forms of cocoon, and he had then stated that the host would most probably prove to be dipterous, or some species of Chalcid parasitic on the miner. The result proved to be as he had imagined. He then exhibited two dipterons of the genus *Phoridae*, Hal., *Phora flava*, Fall., and *P. pumila*, Meig. Also two species of Hymenopterous parasites, one being a Chalcid, and the other a specimen of *Aspilota ruficornis*, Nees., which he had since reared from the cocoons.

JUNE 23rd, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Oldham exhibited several species of Lepidoptera taken in the neighbourhood of Epping this year, among which were three specimens of *Chærocampa porcellus*, L., taken respectively at Theydon, Loughton, and Lords' Bushes.

Mr. J. R. Wellman exhibited specimens of *Lobophora viretata*, Hb., from Burton-on-Trent.

Mr. J. Jäger exhibited bred examples of *Eupithecia venosata*, Fb., which had been two years in pupa.

Mr. W. A. Pearce exhibited bred examples of *Eupithecia castigata*, Hb., from ova taken at Ranmore Common, Dorking, and *E. isogrammaria*, H. S., from larvæ feeding on *Clematis vitalba*, L., Box Hill, Surrey.

Mr. West (Greenwich) exhibited larvæ and cases of *Coleophora palliatella*, Zinck., and *C. currucipennella*, Fisch., the former found on oak at West Wickham, and the latter on oak, saw, and aspen.

Mr. D. J. Rice exhibited eggs of the Night-jar (*Caprimulgus europæus*, L.) from Leith Hill, Surrey.

Mr. H. J. Turner exhibited three Orchidaceous plants, viz.: *Cephalanthera grandiflora*, Bal., *Listera ovata*, Br., *Aceras anthropophora*, Br. Also an example of *Lilium martagon*, L., with sixteen buds, and flowers of *Ajuga chamæpitys*, Schreb., all taken in Headley Lane, Mickleham.

JULY 14th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited three species of Exotic Hymenoptera ; *Xylocopa violacea*, L., *X. latipes*, Drury, and *Taiscolia hæmorrhoidalis*, Fab., and read the following notes :—

“*Xylocopa violacea*, L. (Europe), and *X. latipes*, Drury, from Darjeeling.—The *Xylocopa*, or, as they are commonly and most deservedly styled, “Carpenter Bees,” have very powerful jaws, very much like wire-nippers in appearance, with which they are able to excavate tunnels of from one to two feet in length into solid wood, tearing out the material, chip by chip, very rapidly. Having completed a burrow, the female places at the extreme end a mass of pollen about the size of a large kidney-bean, upon which she deposits an egg. She then covers it with a thin layer of the chips which she originally cleared from the tunnel, repeating the operation until the whole of the burrow is filled with its cells. This genus is spread over all the warmer portions of the earth ; but no species has yet been found inhabiting Britain.

“*Taiscolia hæmorrhoidalis*, Fab. (Hungary).—This fine insect belongs to the group of Aculeate Hymenoptera, called *Scoliidæ*. They are chiefly found in the torrid parts of the world ; and the higher the temperature, the more plentiful the *Scoliidæ*. In some of the genera which belong to this group, the females are apterous, like the *Mutillidæ*. As the habits of these insects are well known, a short description of the economy of this species will answer for the whole. When the female is about to prepare for her future progeny, she seeks a dry sandy spot, and there makes a hole of some 16 or 18 inches deep ; she then goes in search of prey, which is generally the larvæ of some large lamellicorn beetle, such as *Oryctes nasicornis* (or, in some cases, locusts or grasshoppers). Having deposited them at the bottom of the hole, she lays an egg in close proximity. The egg is soon hatched, and the young larvæ at once begin to devour the beetle grub which the mother had placed there for food. The grub is always

large enough to last the *Scolia* larva throughout its first stage of existence ; and when the larva has demolished the grub, it prepares for its change by spinning an oval cocoon, in which it passes to the pupa, and afterwards to the perfect state. If any of our members would like to see these curious cocoons, I would call their attention to a very fine series brought from Florence, many of which are cut open to show the method in which the occupier is packed up within, and are now on view in the insect-room at the Museum of Natural History, South Kensington."

Dr. Rendall exhibited *Acidalia rubiginata*, Hufn., *Eupithecia coronata*, Hb., *E. plumbeolata*, Haw., *Lithostege griseata*, Schiff., *Agrophila trabealis*, Scop., L., all taken at Thetford.

Mr. E. Joy exhibited *Erastria venustula*, Hb., from Epping.

Mr. J. R. Wellman exhibited *Dicranura furcula*, L., and *Eupithecia togata*, Hb., from Perthshire.

Mr. Jäger exhibited *Dicranura bifida*, Hb., bred from ova obtained from a moth taken at Shepherd's Bush ; also fine series of *Scotosia vetulata*, Schiff., and *S. rhamnata*, Schiff., bred from larvæ taken in the north of London. Mr. Jäger stated that these species had been very abundant in the larval stage. The owner of the field in which the buckthorn occurred having cut down the greater part of the bushes, those that were left yielded a far better percentage than usual.

Mr. J. T. Williams exhibited *Heliothis dipsacea*, L., *Hydrelia uncula*, Clerck, and *Agrophila trabealis*, Scop., from Suffolk.

Mr. Tugwell exhibited three specimens of *Dicranura bicuspis*, Bork., bred from pupæ found at Tilgate Forest ; two of the pupæ cases were also shown, one being on the bark, and the other on a twig of birch. Also specimens of *Sesia sphlegiformis*, Fb., from the same locality, and varieties of the larvæ of *Cucullia chamomillæ*, Schiff., taken at Hither Green Lane, Lewisham, the specimens ranging in colour from white to a brilliant pink.

Mr. S. Edwards exhibited a variety of *Abraxas grossulariata*, L., bred by Mr. A. W. Dods from a larva taken

near Edmonton, in which the white ground colour was so thickly sprinkled with minute black atoms as to give the insect a decidedly smoky appearance; the black markings normal, but the yellow rather more intense than in the type.

Mr. R. South exhibited varieties of *Lycæna icarus*, Rott., from Ventnor, Isle of Wight, among which were (1) a male with distinct black spots on the margin of hind wings, a form Mr. South said he had received from Ireland and Scotland, but had not previously seen from any part of England; (2) several females much suffused with blue on the upper surfaces of the wings, one example being especially noticeable on account of its brilliant hue and the absence of discoidal spots; (3) some interesting underside aberrations of the confluent and obsolete types. One of these last is figured in Plate II. (fig. 3).

Mr. J. Jenner Weir exhibited some specimens of *Pieris oleracea*, Bois., from Hudson's Bay, and stated that there was a disagreement between the American Entomologists as to whether this species was identical with *Pieris napi*. In his opinion it was not. Mr. Scudder was very desirous to obtain the larvæ and pupæ of British *P. napi*, and Mr. Weir would be glad to obtain any such for transmission to America, for comparison with *P. oleracea*.

Dr. Rendall exhibited eggs of the Hawfinch (*Coccothraustes vulgaris*, Fleming), from Hertfordshire, together with examples of the brown variety from Switzerland.

Mr. South said that he had this season bred a considerable number of *Hemerophila abruptaria*, Thnb., and had been much interested in watching the construction of the cocoon. The nodular processes on the twigs of lilac exhibited were the cocoons of this species. In a state of nature it would probably be as difficult to detect one of these cocoons as it certainly is to find those of the *Dicranuridæ*. The construction of these pupal chambers by the *Hemerophila* larva was a most interesting performance to witness; and as he had kept the larvæ when nearly or quite full-grown in a large glass cylinder, he had some favourable opportunities of watching certain stages of the operation. Unfortunately, the earliest stage—

that of forming the silken envelope—did not come under observation ; but he had frequently seen a larva engaged in lining the interior of its tenement with fragments of the bark from the lilac stem. This it does in a most methodical manner, and never once, as far as he could see, fails to place the minute chip of bark in proper position, with the rough exterior surface outwards.

Mr. E. Step asked whether any member had observed the effect produced on other animals by the acrid secretion from the back of the Toad. A young Jay (*Garrulus glandarius*, L.) in his possession had recently, with a full crop, eaten two young toads, without exhibiting any ill effects. The following day, however, when its crop was all but empty, it had swallowed two others, with a very different result. The toads were very small, and but a day or two removed from the tadpole stage ; but their immediate effect was to cause the bird's eyelids to close, and its bill to gape persistently. These symptoms were followed by violent convulsive movements of the legs and wings, and the rapid turning of continuous somersaults. The bird seemed completely intoxicated, and to have lost all control over these strange movements of its limbs. There were short periods of inaction between these fits, during which the creature lay on its back, with the beak gaping and the eyes blinking. The paroxysms gradually became less violent, and after about an hour from the commencement of the attack, the Jay was able to perch. For the rest of the day, however, he remained in a stupid condition, making no movement and uttering no sound. By the next morning he seemed to have recovered his usual health and spirits. Mr. Step had little doubt that, had the toads been larger, they would have caused death.

Mr. J. Jenner Weir said he could not speak from experience, but Mr. Bond had told him that he once had a Heron that was killed through eating a toad, although the latter was vomited almost immediately after it had been swallowed.

Mr. Billups called attention to the unusual abundance of the larvæ of *Pieris brassicae* in the neighbourhood of West Ham, Essex, the whole of the cabbages in that neighbour-

hood having been destroyed by them, although cauliflowers growing in the same fields had not been touched. In the discussion that followed, several other members stated that they had noticed numbers of larvæ in different districts, and reference was made to the unusual number of *P. rapæ* this year.

JULY 28th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

The Rev. W. F. Johnson, F.E.S., was elected a Corresponding Member.

Mr. W. West exhibited specimens of *Apamea ophiogramma*, Esp., taken flying over Ribbon Grass in his garden at Streatham, and remarked that two years ago he showed some larvæ found on the same clump of grass, which were not identified at the time, but were thought by several members to be the larvæ of this species. Unfortunately he was unable to rear these larvæ; having now, however, captured the species in considerable numbers flying over this particular clump, he thought it was probable that the larvæ then found were those of the species he was now exhibiting.

Mr. R. Adkin considered it would be much more satisfactory if Mr. West could again find larvæ, and rear the perfect insect.

Mr. J. T. Williams said that Ribbon Grass had been introduced into this country, but the larvæ of *A. ophiogramma* were said to feed on the roots and stems of species of *Arundo* which were to be found growing on the Greenwich marshes. The species used to occur sparingly on these marshes, and also on the Hammersmith marshes.

Mr. Tugwell exhibited bred specimens of *Apatura iris*, L., and pupæ cases of the same, the larvæ having been found at Brockenhurst.

Mr. T. W. Hall exhibited varieties of *Abraxas grosulariata*, L., one having a distinct yellow band on the hind wings. Mr. Hall said he had bred four distinct species of parasites, *Cassinaria vidua*, Gr., and its hyper-parasite, *Meso-*

chorus fulgurans, Hal.; *Hyctodissa lucorum*, Fall., and one specimen—a female—of *Paniscus cephalotes*, Holm.

Mr. W. G. Sheldon exhibited *Pempelia palumbella*, Fb., and *Bomolocha fontis*, Thnb., from Leith Hill; *Eupæcilia amandana*, H.-S., from Sanderstead, and with reference to this last species, said that it was usually described in books as rare, but he did not think it was so, as he had found it very commonly in the neighbourhood where he captured it. It appeared to have a flight lasting about two minutes, and two minutes only.

Mr. R. South exhibited two varieties of *Melitæa cinxia*, L., from the Isle of Wight, which varied from the type in the following manner:—Upper surface, fore wing: central line or band absent, hind marginal lines interrupted. Under surface, hind wing: the usual fulvous band towards hind margin much contracted, and showing a tendency to break up and form ocelli; a fulvous patch extending from base of wing to the external edge of usual basal band. Mr. South stated that the male was taken on the 11th June, and the female on the same spot on the 17th June. Both had just emerged, and were drying their wings at the moment of capture. (The two specimens are figured Plate I. figs. 1 ♂ and 2 ♀.)

Mr. E. Step exhibited the skin of a stoat (*Mustela erminea*, L.), taken on the Society's excursion to Mickleham.

Mr. W. G. Sheldon stated that he had recently seen a Kangaroo at Leith Hill, and asked if any of the members knew whether or not one or more of these animals had recently been turned out in that locality.

Mr. Rice had some recollection that three or four years back there was some talk of kangaroos having been seen on Leith Hill, and promised to make inquiries as to whether any were kept in that district.

Mr. Billups said that the Great Kangaroo and others of its kindred breed freely in this country, many British-born individuals existing in the Zoological Society's Gardens, and in private collections.

AUGUST 11th, 1887.

R. SOUTH, Esq., F.E.S., *Vice-President*, in the Chair.

Mr. C. H. Watson exhibited *Catocala promissa*, Esp., from the New Forest.

Mr. West (Streatham) exhibited *Sesia asiliformis*, Rott. (bred), and a variety of *Lycæna corydon*, Fb. This example was normal as regards the upper surface, but on the under side there was an almost entire absence of ocelli, the only remaining ones being the discoidal and another towards the hind margins of fore wings, with one or two on the hind wings. The black crescents on the margins of all the wings were strikingly developed. Also a variety of *Argynnis euphrosyne*, L., with two-thirds of the upper side black, and slight yellow markings on the outer third. The wings are much darker than usual, and the ordinary markings much more distinct and darker; the under side not showing any marked peculiarity.

Mr. A. W. Mera exhibited a series of *Thera simulata* Hb., from Ireland.

Mr. Fremlin exhibited some specimens of *Vanessa urticæ*, L., in which the normal bright red-brown colour was replaced by a smoky brown, and the black markings were inconspicuous. Further, the body and bases of the wings were without any of the usual hair-like scales, and the wings altogether seemed to be ill-developed. Mr. Fremlin considered the peculiar appearance of the specimens due to premature emergence, and added that the insects had possessed so little vitality that some of them were dead the day after leaving the pupa, and the others were in a moribund condition.

Mr. R. South exhibited a variety of *Triphæna comes*, Hb., with cream-coloured hind wings; a variety of *Vanessa io*, L., with a second ocellus; also a specimen of *Carpocapsa saltitans*, Westw., bred from the so-called "jumping seeds," from Mexico, exhibited by Mr. McLachlan at the Society's Annual Exhibition; and called attention to the aperture in the seed through which the insect had emerged. This aperture, he said, was provided with what seemed to be a hinged door, the construction of which appeared to be a marvel of neat

workmanship. Before the escape of the imago there was no trace of any convenient exit, and it was only by pressing the hard seed capsule between the finger and thumb that the existence of a perforation could be detected. Pressure caused the skin of the seed over the boring to become depressed, and so the situation of the hole was discovered.

Mr. J. R. Wellman exhibited *Dianthæcia albimacula*, Bork., forms of *Bryophila muralis*, Forst., and a yellow variety of *B. perla*, Fb., all from Folkestone; *Plusia interrogatōnis*, L., from Perth; also dwarfed forms of *Aspilates gilvaria*, Fb., *Eubolia bipunctaria*, Schiff., and *E. limitata*, Scop., which he stated were all captured on the slopes of the hills near the Canterbury Road. It was remarkable that there should be so many undersized examples.

Mr. R. South observed that these small specimens were very interesting, and were no doubt to be attributed to the parched and stunted condition of the larval food-plants, owing to the unusually dry summer.

Mr. Barker, on behalf of Mr. G. A. Lewcock, exhibited a large series of Coleoptera, including a specimen of *Sericosomus brunneus*, L., from Esher; a long series of *Bembidium lunatum*, Duft. Mr. Lewcock has occasionally taken the latter singly on the banks of the Thames at Rainham, Essex; but during last season he captured about a dozen specimens one afternoon in August. The following species of *Donacia* were also shown (all taken during the year), and the accompanying notes read:—

Donacia versicolora, Brahm., and *D. dentata*, Hoppe, from the Basingstoke Canal and Farnham, obtained chiefly on the floating leaves of several water-plants. The best means of capturing these species is to submerge the resting-place, when, being deprived of the means of flight, the insects could be easily taken. *D. hydrochæridis*, F., from the stems of rushes, Basingstoke Canal; the best time to take it being early in the morning. *D. bicolora*, Tsch., Basingstoke Canal and Farnham, frequenting the yellow Iris; also to be swept at times from the low rushes. *D. thalassina*, Germ., Basingstoke Canal, Esher, Farnham, and Sunbury; generally common

where it occurred, on the low rushes, but could also be picked off the taller species of rushes late in the evening. *D. limbata*, Pz. from Wanstead Park, Essex, also Farnham and Sunbury; not common, chiefly on Iris and Sparganium. *D. semicuprea*, Pz., abundant in the same localities as the last species. *D. simplex*, F., found principally in running water, and not so commonly in Surrey as the two previous species. *D. vulgaris*, Tsch., Esher and Farnham; commonly on *Typha latifolia* about two years ago, but scarce this year. *D. clavipes*, F., Esher; not common this year. *D. sericea*, L., Esher, Sunbury, Farnham, and Rainham, Essex, commonly. *D. discolor*, Pz., seven or eight specimens swept from the marsh near the Basingstoke Canal. *Cryptocephalus lineola*, F., by sweeping at Esher. *Corymbites tessellatus*, L., Esher and Woking. *Telephorus lateralis*, L., and *Phyllobrotica quadrimaculata*, L., Farnham; *Malachius æneus*, Sunbury, four other species, occurring in Surrey, viz., *M. bipustulatus*, L., common everywhere; *M. viridis*, F., Farnham; *M. ruficollis*, moderately common at both Farnham and Esher; *M. pulicarius*, F., not commonly, at Esher only; *Cionus scrophulariæ*, L., common; *C. tuberculosis*, Scop., not common, Farnham; *Lebia chlorocephala*, E. H.; *Tanymericus palliatus*, F., and *Clytus mysticus*, L., all from Esher.

Mr. Rice said he had made inquiries as to the kangaroo which, at the last meeting, Mr. Sheldon said he had seen at Leith Hill, and had ascertained that it was the property of W. J. Evelyn, Esq., M.P., who turned some of these animals loose about five years since. A pair bred the same year, and some of their offspring were still living, but were rarely seen except by the keepers.

Mr. John T. Carrington added that he recollected the turning out of these animals being recorded in *The Field*.

The Secretary read a letter from the President recording the unusual abundance of *Pieris brassicæ*, L., and *P. rapæ*, L., in the neighbourhood of Eastbourne, Sussex, and calling attention to their settling in numbers around puddles in the freshly-watered roads of the town.

Mr. J. T. Carrington stated he had had many opportuni-

ties since the end of June of noticing the gradual increase in numbers of these species, and had seen about the beginning of the month immense numbers, principally of *P. rapæ*, on a bed of Lavender growing in one of the Brighton squares. He had not, however, heard of any unusual number of larvæ having been noticed in the Brighton district before the arrival of the swarms of imagines, and it was possible that these last were immigrants. The habit of drinking was not at all uncommon among Lepidoptera in hot countries.

Mr. South said *P. rapæ* had been unusually abundant in his garden at St. John's Wood, and he had frequently seen them on the watered roads of London. He quite agreed with Mr. Carrington that the appearance of these species in such numbers was to be attributed to immigration.

Mr. T. W. Hall said he had noticed large numbers settling in the moist ditches by the side of the railway at Ware.

Mr. Step thought that some of the members would recollect noticing on the occasion of the Society's excursion to Bookham, in 1886, a nearly dry pool, the margins of which were literally covered with bees drinking. Messrs. Wellman and Tugwell and Dr. Rendall also mentioned having seen great numbers of the two species of *Pieris*.

AUGUST 25th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Cooper exhibited *Argyrolepidia æneana*, Hb., Haw., bred from larvæ found in South Essex.

Mr. J. R. Wellman exhibited *Noctua festiva*, Hb., var. *conflua*, Tr., from Perth, and *Plusia chryson*, Esp., from Newmarket.

Mr. J. W. Tutt exhibited a *Gelechia* of doubtful species; a short series each of *Depressaria yeatiana*, Fb., *Doryphora palustrella*, Dougl., *Crambus contaminellus*, Hb., *C. alpinellus*, Hb.; a comparative series of *Lita semidecandriella*, Threlfall., and a new species, *Lita blandulella*, Tutt.; dark forms of *L. marmorea*, Haw.; two specimens of *Melissoblaptes anellus*, Schiff., without the characteristic spots; and a very dark blackish *Depressaria*

belonging to the *heracliana* group, which cannot be identified as belonging to any of our known British species. The whole from the neighbourhood of Deal, and taken in the early part of August, 1887.

Mr. H. T. Dobson exhibited *Thecla quercus*, L., *Selenia tetralunaria*, Hufn., and *Eugonia erosaria*, Bork, all from larvæ obtained in the New Forest.

Mr. H. E. Barren exhibited a large specimen of *Polyommatus phlæas*, L., with unusually broad border to fore wings.

Mr. Tugwell exhibited *Boarmia abietaria*, Hb., bred from larvæ beaten out of yew, June 1st, 1887; the first imago emerging July 2nd, the last August 4th.

Mr. E. Sabine exhibited *Lycæna icarus*, Rott., males of varying blue tints, blue females, and a dwarf male barely $\frac{3}{4}$ ths of an inch in span, underside with confluent spots, and an underside of male, with left wings normal and right wings of the obsolete type; also males of *L. bellargus*, Rott., of various shades of colour, and females more or less blue; a fine series of probable hybrids, male and female, between *icarus* and *bellargus*; also forms and varieties of *L. corydon*, Fb., dwarfed, deep blue, grey, and other shades of the male, brown, blue, and other females, undersides of the males of the obsolete type, and fine examples of the streaked form. Mr. Sabine stated that, with the exception of the dwarfed *icarus*, all the specimens shown were taken during the season in one locality in Kent.

SEPTEMBER 8th, 1887.

T. R. BILLUPS, Esq., F.E.S., in the chair.

Mr. J. T. Williams exhibited a living specimen of *Sphinx convolvuli*, L., taken that morning on his bed-room window at Foot's Cray, Kent, and asked whether the species deposited its eggs in the autumn or following spring, as he had last year tried to obtain ova, but without success, and he knew of no records of the larva having ever been found in England.

Mr. J. T. Carrington, in reply, said that he did not remember hearing of the capture of any hybernated specimens

of this species. In the west of France it was quite common in some districts, the larvæ being found on the small bind-weed (*Convolvulus arvensis*, L.), growing amongst corn, as many as forty or fifty sometimes being taken in one search.

Mr. J. T. Williams also exhibited a dwarfed specimen of *Drepana binaria*, Hufn., and said that the larva from which this specimen was bred, he obtained by beating in the New Forest; it immediately pupated. He attributed the smallness of this specimen and the number of dwarfs of different species he had met with during the season, to the dryness of the atmosphere and consequent dryness of the food-plants.

Messrs. Billups, Wellman, Carrington, and others concurred with Mr. Williams as to the cause of these dwarfed examples.

Mr. W. G. Sheldon exhibited long series of *Agrotis agathina*, Dup., and *Noctua castanea*, Esp., and var. *neglecta*, Hb., taken at Shirley on the flowers of heather, and remarked that *A. agathina* had occurred more freely this season than of late years, although he had only managed to obtain four larvæ in four nights searching.

Mr. J. T. Williams said this was a strange fact, as at one time in the same locality the larvæ were so common that it was easy to get upwards of a hundred of them in an hour.

Mr. E. Joy exhibited two melanic varieties of *Vanessa urticae*, L., bred from larvæ found at Folkestone, one being normal on the left and melanic on the right side.

Dr. Rendall exhibited *Lobophora halterata*, Hufn., from Hounslow.

Mr. H. T. Dobson exhibited *Emmelesia albulata*, Schiff, var. *thules*, Weir, and a number of tortrices from the Shetland Isles.

Mr. J. T. Carrington exhibited a cocoon of *Dicranura vinula*, L., formed among cotton wool.

Mr. West (Greenwich) exhibited *Rhantus pulverosus*, Step., *R. notatus*, Berg., the red form of *Agabus bipustulatus*, L., *A. conspersus*, Marsh, *Philonthus punctus*, Gr., all taken on the marshes near the river, at Erith, Kent.

Mr. J. T. Carrington exhibited specimens of the Hessian

Fly (*Cecidomyia destructor*, Say.), with infected straw, and remarked that his exhibit came from Gloucestershire, which he thought was as far west as the insect had yet been found. That it was likely to become permanently established in this country he considered very doubtful. The present year seemed to have been exceedingly favourable for its multiplication on account of the extreme dryness; he had heard it suggested that warm humid seasons were most suitable for its increase, but he thought this was exceedingly improbable, as in Russia and Central Europe, where it occurred, the summers were generally dry. After one or two wet seasons he had very little doubt that the species would disappear from Britain altogether. It was also probable that it had occurred in this country for a much longer period than was supposed.

Mr. Billups said that this last observation was correct, the species having been found as many as fifty years back, being brought here from Russia.

Dr. Rendall said that a farmer in Wiltshire, who was not an Entomologist, informed him he had found it in his wheat for a good many years.

Mr. T. R. Billups exhibited, on behalf of Mr. T. D. A. Cockerell, a box of insects collected at West Cliff, Custer Co., Colorado, at an altitude of about 8,000 feet above sea level. These included two species of Longicorn Beetles, *Criocephalus agrestis*, F., and *Leptura cribripennis*, Lac., also several species of Carabidæ, Histeridæ, Coccinellidæ, etc. Among the Hymenoptera were several species of Ants, including *Formica integra*, F., and several other species not in the National Collection. There were also two species of Ichneumonidæ, one of Cerцерidæ, two of Mutillidæ, and several other species apparently new to science. Besides these there were types of the local Diptera, Lepidoptera, Neuroptera, etc.

SEPTEMBER 22nd, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Mr. Jäger exhibited *Callimorpha hera*, L., and var. *lutescens*, Staud., from Starcross, Devon, and stated that he had obtained ova, and now had the larvæ feeding.

He also exhibited *Stilbia anomala*, Haw., taken near Tenby, on heather. These were all males, and Mr. Jäger said he had been unable to meet with the female of the species. The males, however, were fairly common one night, but afterwards very few were seen.

Mr. Adkin remarked that he understood this frequently occurred with this insect.

Mr. Sheldon exhibited *Xanthia fulvago*, L., and var. *flavescens*, Esp., and said they came from a valley in Derbyshire. It was remarkable that this valley alone of all the surrounding district produced, to a large extent, melanic specimens; in the neighbourhood the Lepidoptera found were generally of the light southern forms, while in this particular valley many species were almost black; for example, *Tephrosia biundularia*, Bork., *Thera variata*, Schiff., and others.

Mr. Cooper exhibited series of *Ephippiphora obscurana*, St., from Epping Forest, *Eugonia quercinaria*, Hufn., among which were many interesting dark forms; *Melanippe galiata*, Hb., examples of the second brood; dark forms of *M. fluctuata*, L., from Aberdeen.

Mr. Goldthwaite asked whether the specimens of *E. quercinaria* had been bred from an ordinary female, or from one showing any strong dark markings, as he had obtained a batch of eggs from a very dark female, and did not breed a single specimen worth calling a variety.

Mr. Cooper, in reply, said that the female from which the ova were obtained was so worn that it was impossible to say whether it varied from the ordinary form or not.

Mr. Goldthwaite exhibited varieties of the underside of *Lycæna bellargus*, Rott., including an underside of the male of the obsolete form.

Mr. Carpenter exhibited a number of *Argynnis paphia*, L., var. *valesina*, Esp., from the New Forest.

Mr. Weir said that this variety had been very plentiful this year in the New Forest, and Mr. Carpenter's box contained three very interesting specimens, one of which was very much smaller than the ordinary form, and the colour of the fore wings was more like that of the ordinary female *Paphia*; hind wings much darker, approaching closely that of *Valesina*. Another example was very dark, smoky-green in colour, the usual pale blotches in the fore wings being quite absent. And in the third specimen the pale blotches were unusually distinct and numerous.

Mr. Tutt exhibited *Melanthia bicolorata*, Hufn., var. *plumbata*, Curt., from Rannoch.

Mr. Oldham exhibited *Dicycla oo*, L., from Epping Forest, and stated that he had this season taken some twenty specimens in that locality.

Mr. Weir said it was very remarkable that Mr. Oldham should have taken so many as twenty *D. oo* at Epping, as the species had not occurred in any plenty in the New Forest for a number of years.

Mr. Tutt remarked that *D. oo* had been very common this year—it had occurred at Shooter's Hill, and very freely indeed around Bromley.

Mr. J. T. Williams said the species had occurred year after year at Fairmead Bottom, Epping Forest.

Mr. Skinner exhibited a specimen of *Deiopeia pulchella*, L., taken at Dover, 1886, a bleached specimen of *Epinephele ianira*, L., from Herne Bay, Kent, and forms of *Zygæna filipendulæ*, L., having a pink shade of red instead of the usual crimson, bred from larvæ obtained from Caterham.

Mr. R. Adkin exhibited a specimen of *Anticlea cucullata*, Hufn., bred from a larva found on a bunch of *Galium* brought from Eastbourne.

Mr. Elisha exhibited *Gelechia hippophaella*, Schr., bred from larva in the shoots of *Hippophaë rhamnoides*, L., from the Sand Hills, Deal, *G. vilella*, Zell., bred from larva found in the seed heads of *Malva sylvestris*, L., from Southend;

Incurvaria capitella, Clerck., from larva feeding in the shoots of currant, Highgate.

Mr. J. Jenner Weir exhibited specimens of *Carpocapsa saltitans*, Westw., and remarked that one emerged in July, no more coming out until September. This gentleman also exhibited a living larva of the Ant Lion (*Myrmeleon europæus*, L. The example exhibited was taken by Mr. Weir at Fontainebleau in the sand-rocks, where the gradual disintegration of the rocks had formed a mass of sand; the ant lions were always found on the side most sheltered from the sun. The Myrmeleonidæ were found throughout the whole of dry Europe, and very plentifully in Australia. Mr. Weir then gave an interesting account of the habits of the species exhibited, as observed by him.

Mr. West, of Greenwich, exhibited eight species of Coleoptera—namely, *Haliphus confinis*, Step., *H. fulvus*, F., *H. flavicollis*, Sturm., *H. cinereus*, Aubé., *H. fluviatilis*, Aubé., *H. ruficollis*, De G., and *H. lineatocollis*, Marsh., and remarked that the genus only contained eleven species, and he had taken eight of these from one pond in the neighbourhood of Lewisham.

Mr. Billups, on behalf of Mr. Tugwell, exhibited a species of Ichneumonidæ, *Limneria ensator*, Gr., and one of Braconidæ, *Macrocentrus linearis*, var. *pallidipes*, Gr., both bred from *Cucullia gnaphalii*, Hb., the species of Braconidæ being a very unusual parasite from such a host.

Mr. Billups, on Mr. Elisha's behalf, also exhibited an exceedingly fine specimen of *Rhyssa persuasoria*, L.

And on behalf of Mr. Turner, he exhibited two old wedges which had been used to fasten the chairs, holding the rails to the sleepers, on the London, Brighton and South Coast Railway between New Cross and Forest Hill, containing the nests of *Osmia rufa*, L., one of the most abundant of the bees found in England. Mr. Billups said this last exhibition was particularly interesting, as showing how the family *Osmia* adapted its cells to suit its surroundings. In hilly countries, or on the coast, it generally formed its burrows in the cliff or sandy bank, while in more cultivated districts it

would choose a decaying tree, preferring the stump of an old willow ; at other times it burrowed in the mortar of old walls, or availed itself of the lock of an old building, or a cavity in the flint stones used for garden walls ; in fact, the family seemed to have adopted the system of giving themselves as little labour as possible as regards their homesteads. Even musical instruments did not come amiss to them ; for in the National Collection at South Kensington there was a fife which was completely occupied by the cells of this bee. The genus contained probably sixty to sixty-five species, ranging over Europe, North Africa, the United States, Nova Scotia, and Hudson's Bay ; but only ten species occurred in this country.

Mr. West (Streatham) exhibited a number of Alpine plants, including Edelweiss, Alpine Rose (*Rhododendron hirsutum*), and *Alchemilla alpina*.

Mr. Goldthwaite said he had received a letter from Mr. Barclay, in which he stated that *Sphinx convolvuli*, L., was extremely abundant at Cromer, he being able to take dozens in an evening.

Mr. J. T. Williams said eighteen had been taken by a lad in a garden at Sidcup, Kent, flying over the white tobacco plant ; while a lad in the adjoining garden, not having any tobacco plants, had sugared for *convolvuli*, but without success.

Mr. Cooper said he had heard of several being taken in and around Stratford.

Mr. Tutt said it seemed general this year, as he had heard of captures in Somerset and Kent.

Mr. Sheldon said several had been seen at Croydon ; and many other members reported the appearance of this species in England.

Mr. J. Jenner Weir stated that he had recently seen in the Jardin d'Acclimation in Paris five hybrids, between the goat and sheep, four females and one male, presented to the Directors of the Gardens by the President of the Republic of Chili, which were said to be a cross between a he-goat and a ewe, the ram and two of the ewes being of a grey colour, the

other ewes being nearly black. He never recollected reading or hearing of similar hybrids ever having occurred in this country, although goats were frequently kept in neighbourhoods where sheep were bred in large numbers.

OCTOBER 13th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Dr. Rendall exhibited *Xanthia fulvago*, L., var. *flavescens*, Esp., and *X. flavago*, Fb., bred from sallow catkins, gathered in the spring.

Mr. Tugwell exhibited a specimen of *Sphinx convolvuli*, L., taken at Greenwich, and varieties of *Spilosoma menthastris*, Esp., bred in Forfarshire by Mr. Kirk, one specimen (figured plate 1, fig. 4) being remarkably fine. Mr. Tugwell stated that in that district of Scotland there was a general tendency evinced by *menthastris* to vary the spots—coalescing so as to form streaks or dashes of black coloration, but in a less degree than in the specimen figured; the ground colour, too, being often darker than in our southern examples.

Mr. Levett exhibited two varieties of *Smerinthus tiliæ*, L., the central band in each being represented by a spot.

Mr. Fremlin said that at the meeting of the Society held in May last he exhibited specimens of *Vanessa urticæ*, L., showing immaturity. He had since bred others, which he now exhibited. The specimens had no hair on the wings, and were very dull in colour.

Mr. South exhibited four examples of *Argynnis selene*, Schiff., and one of *A. euphrosyne*, L., and read the following notes:—

“Specimen No. 1 is an aberration similar in character to that of *Argynnis paphia*, L., from the New Forest (figured Entom. xv., plate 1, fig. 3). The pale blotches are, however, confined to the fore wings of this specimen, and are, moreover, situated in a somewhat different position, being rather in the centre of the wing than towards the apex, as is the case in the variety of *paphia* referred to. The specimen was

taken by Mr. Robert Calvert, of Bishop Auckland, Durham, who kindly sent it to me, together with a most interesting series of *Argynnidæ* from his district.

"With regard to the probable cause of these pale patches of colour on the wings of certain *Argynnidæ*, I should like to say a word. At a meeting of this Society last year (September 2nd, 1886, Abstract, p. 55), Mr. Jenner Weir exhibited seven specimens of *Argynnis paphia*, and one example of *A. euphrosyne*, all of which had pale spots on the wings. In the discussion which ensued as to the origin of these spots, various suggestions were put forward, and I stated that I thought the sun's rays passing through a globule of water and falling on the pupa might cause such kind of bleaching, as was seen in the specimen then exhibited. This summer, having a number of *Vanessa io* pupæ, I thought I would try a few experiments in the direction of my suggestion. As, however, I could not manage to get a drop of water into proper position, I had recourse to a reading glass of moderate power. Selecting nine pupæ of *io*, I divided them into three batches and concentrated the sun's rays on the left, right, and both wings respectively of each batch. As soon as the subject operated on became aware of what was going on he gave a sudden jerk, and the treatment was at once suspended. The result of these experiments was not quite what I had expected, for the pupæ operated upon produced insects with crumpled wings on the right, left, or both sides, the injury being in each case on the side or sides which had been singed. I may now say that I don't think the sun's rays passing through water has anything to do with the white or pale spotted varieties adverted to.

"No. 2. An example of *Aselene* from Perth, in my collection, by the courtesy of Mr. S. T. Ellison, of that town.

"The peculiarity of this specimen lies in the fact that certain of the normal black markings are absent. I have several specimens in which the central angulated line is more or less attenuated, but this is the only specimen I have in which the central line has quite gone.

"Nos. 3 and 4 show the two extremes between which all my

examples of *A. selene* fluctuate in the character of their under-side ornamentation. On looking at the primaries of No. 3 it will be seen that the yellow colour which in No. 4 occupies only the tips of the wings, is spread over nearly the whole of the costal half of the wing, and is also continued along the hind margin to the angle. The brown bands on the hind wings of No. 4 are deeper in colour and less interrupted than in No. 3.

"No. 5 is a specimen of *Argynnis euphrosyne*. The dilated character of the lines in this compares curiously with example No. 2 of *A. selene*. Unfortunately I know nothing of the history of this specimen, except that it was one of a series of the species in the Stowell Collection, sold at Stevens' some months ago."

Mr. South also exhibited an apparently apterous specimen of *Zygæna filipendulæ*, L., bred from pupa taken at Folkestone.

Mr. Jenner, of Lewes, exhibited two specimens (male and female) of a species new to Britain—namely, *Acidalia immorata*, L., taken by Mr. H. C. Morris, of Lewes, on heather, in that locality, and remarked that Berce placed it in the genus *Strenia*, Dup.; but, following Staudinger's arrangement, it came close to *Acidalia emarginata*, L.; the species was most likely to turn up on heaths, the larva feeding on *Calluna vulgaris*.

Mr. Jäger exhibited specimens of a species of Coleoptera which had been sent to him from Tenby.

Mr. Billups declared the species to be *Nebria complanata*, L., a very local species of Carabidæ, occurring only in the neighbourhood of the Bristol Channel.

Mr. West, of Greenwich, exhibited specimens of *Hydattus seminiger*, De G., from Lee, and stated that he had not met with this species for twelve years until now, although he had searched the district every year during that time.

Mr. Oldham exhibited a photograph of *Helix arbustorum*, var. *flavescens*, monstrosity *sinistrorsum*, taken this year at Ashwood Dale, near Buxton.

OCTOBER 27th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. W. H. B. Fletcher, M.A., F.E.S., and C. E. M. Ince were elected members.

Mr. C. A. Briggs exhibited varieties of *Lycæna corydon*, Fb., taken this year, among which were many dwarfed specimens, undersides of the obsolete type, others with the spots coalescing or partially absent, and several streaked forms.

Mr. Ince exhibited an aberrant specimen of *Argynnis paphia*, L., in which the spots on the under surface of the left superior wing had united and formed an irregular-shaped blotch in the centre of the wing.

Mr. Sheldon exhibited living larvæ of *Eupithecia expallidata*, Gn., and of *Rhodophaea consociella*, Hb., and with reference to the latter, stated that he was not aware this species hybernated in the larval state. It appeared, however, to feed in the same way in the autumn as in the spring; and towards the approach of winter it spun a few threads together, in which, no doubt, it hybernated.

Mr. Cooper remarked that he had during the past week, while searching for the larvæ of *Cryptoblabes bistriga*, Haw., made the same discovery as Mr. Sheldon, having found several colonies of the larvæ of *R. consociella*, and he had not the least doubt this species hybernated as a larva. As far as he knew, the fact had not been recorded, and he thought it was a most interesting discovery.

Mr. Tutt observed that he believed the larvæ did hybernate, coming out to feed in the spring immediately the oak buds began to appear.

Mr. Tutt exhibited a cocoon of *Saturnia pavonia*, L., having two exits, and remarked that there was only one pupa inside, and that Mr. J. A. Clark, of Hackney, had informed him that he had recently had a similar cocoon of *Bombyx trifolii*, Esp. Mr. Tutt expressed an opinion that these cocoons might be more frequent than was usually believed.

Mr. Robinson, who was present as a visitor, exhibited *Tapinostola fulva*, Hb., *Plusia chryson*, Esp., bred from larvæ

found in Wicken Fen ; also a species of *Noctua*, which Mr. Weir thought was probably a variety of *Orthosia upsilon*, Bork.

Mr. Step exhibited a number of photographs of Fungi, and remarked that it was most difficult to preserve this large group ; and not having time in which to sketch the different species, he had recourse to photography, the result in most cases being very successful, the exceptions being those of a red colour. The specimens from which the photographs were taken were all from Wimbledon Common, and comprised, among others, *Amanita muscarius*, L., *A. rubescens*, Pers., *Lepiota procerus*, Scop., *Clitopilus orcella*, Bull., *Clitocybe nebularis*, Batsch., *Armillaria melleus*, Fl. Dan., *Boletus scaber*, Fr., *Pholiota squarrosus*, Müll., *Russula heterophylla*, Fr., *R. emetica*, Fr., *R. nigricans*, Fr., etc.

Mr. J. Jenner Weir said he should like to make a remark on the rarity of *Pieris napi*, L., being desirous of sending ova to America, as mentioned by him at the meeting on July 14th last. He had spent a good deal of time in trying to take the species, but with very little success. Of the spring emergence he only captured one male, and of the autumn emergence he only took two worn females, from which he failed to obtain eggs ; he had not only failed himself, but friends who had tried to assist him had been unable to do so.

Mr. Carrington alluded to the extraordinary abundance of *Pieris brassicæ*, L., and *P. rapæ*, L., and remarked that he had not noticed a single specimen of *P. napi*.

Mr. Sheldon thought that *P. napi* was not so universally distributed as the other two species.

Mr. Cooper said he had written to a Scotch correspondent to get him a series of *P. napi*, but he had been unable to do so, although the other two species already referred to had been common ; he had himself taken two or three females but was unable to obtain ova.

Mr. J. T. Williams said *P. napi* had been very common at Foot's Cray, Kent ; and Mr. Tutt said it had appeared in immense numbers at Deal.

Mr. R. Adkin read the following "Notes on Collecting

at Eastbourne," and exhibited specimens of many of the species referred to:—

"The past summer has been so exceptional on account of the small rainfall, that any notes of observations with regard to insect life made during that period may be worth recording. I trust, therefore, that the result of sundry flying visits, extending over the month of August and first week of September, to the town of Eastbourne, and that part of the Sussex Downs situate between it and Beechy Head, in quest of Lepidoptera, may not be uninteresting.

"Perhaps the most noticeable feature was the unusual abundance of some species, and the comparative scarcity or complete absence of others. Many of the commoner Butterflies were much more common than usual; this was especially the case with *Pieris brassicæ*, L., and *P. rapæ*, L. A great deal has already been said on this subject, so much, indeed, that I feel some diffidence in again touching upon it; but there are one or two points that I should like to mention. In the first place, I have heard it asserted that this 'swarm of white's' included all three of our usual species. However this may have been in other localities, I cannot say; but my experience was quite the reverse. Of the many specimens that I examined, with a view to satisfying myself as to their identity, and perhaps with a faint hope that in so promising a locality I might perchance turn up a veritable British *daphnigera*, L., there was not one single specimen of *napi*, L.; but *brassicæ* and *rapæ* occurred in about equal numbers. Then as to the probable cause of their great abundance: the immigration theory offers such an easy solution of the question that it is hardly to be wondered that we are apt to jump at it, and consider the matter thus definitely settled. But should we not also look at other possibilities? I do not for one moment doubt the probability of a certain number of individuals reaching us from the other side of the channel; indeed, there appears to be good evidence that such is the case. But if my information is correct, these species are not usually more abundant there than with us; and if that is so, we can hardly suppose that any contingent would be likely

to arrive on this side of the water, either in spring or summer, large enough to account for the unusual numbers seen this year. But, assuming that from some cause these insects are unusually abundant on the opposite coasts, so as to be able to migrate in numbers to this country, might not the same causes which favour their abundance there apply equally on this side, without the intervention of migration? Probably under ordinary conditions considerably less than 10 per cent. of the ova deposited by the parent produce imagines, their enemies are so numerous that it almost seems wonderful that any escape. But let us suppose that by a combination of circumstances some of these enemies are held in check for a season. Should we not then have an unusual abundance? It appears to me that such a state of things is by no means impossible, and that the question is one well worthy of further impartial investigation.

"Among the other butterflies noted were *Satyrus semele*, L., and *Epinephele ianira*, L., both very common, many of the latter being considerably under the average size; *E. tithonus*, L., *Pararge megæra*, L., *Cænonympha pamphilus*, L., *Polyommatus phileas*, L., *Lycæna icarus*, Rott., *L. bellargus*, Rott., and *L. corydon*, Fb., all in considerable numbers, together with a few *Argynnis aglaia*, L. With regard to *L. corydon* and *bellargus* some diversity of opinion appears to have existed as to whether these two species were usually to be found flying freely together, and I was certainly under the impression that the former was almost, if not quite, over before the latter began to appear at any particular place; but my observations this summer lead me to quite the opposite conclusion. On my first visit to the Downs (August 1st), *corydon* was flying very commonly; and on each successive visit, up to the 21st, a similar state of things was noted. On that day a male was taken just emerged from pupa, but up to this time no *bellargus* had been seen. On the 28th another freshly emerged male *corydon* was observed, and both sexes were flying abundantly, many of each being in perfect condition. On this day I saw my first *bellargus* (2 ♂). On September 2nd a heavy storm swept the coast, and broken weather continued for

several days ; but on visiting the locality again on the 16th, I found both species commonly. Many of the *corydon* were still quite fresh, and some of the *bellargus* were decidedly worn ; indeed, there was little to pick between the two species as to condition : they were flying freely together, and resting on the same flowers. It may not be out of place here to mention that on September 1st Mr. E. Sabine sent me for inspection some thirty or forty pill-boxes, each containing a living *L. bellargus* or *L. corydon*, all taken on the previous day, and called my attention to the fresh condition of many of the latter species ; he also wrote that the second brood of *bellargus* commenced to appear on August 8th ; and on September 9th, he further wrote, saying that the two species were still flying, but owing to the recent rough weather, each was in considerably reduced numbers. Yet there were among each some specimens "evidently not long out of the pupa." His experience, therefore, appears to agree pretty closely with my own, except that the date he gives for the appearance of *bellargus* is considerably earlier than that on which I observed it ; but this may be accounted for by the difference in locality—his being inland, while mine was on the sea coast.

"My observations of the markings of these species were confined chiefly to *corydon*, and more particularly to the arrangement of the spots of the underside. Variation was very frequent, probably one in ten of the specimens examined varying in a greater or less degree from the normal type, but always in one of two directions ; on the one hand, the basal spots, especially the lower one, have a tendency to become elongated towards the centre of the wing, sometimes joining the lower one of the central row, and thus forming a band or blotch near the inner margin ; while, on the other hand, the tendency is towards a disappearance of the basal spots, which in some cases are altogether absent. These forms of variation are, I believe, by no means confined to this particular locality or to this one species, but are to be found as commonly both in *bellargus* and *icarus*, indeed, of the last-named I took examples in which each was well defined. I am aware that this is a subject that has already received considerable

attention, and that some, well able to form an opinion, possibly far better than I am, have declared that there is "nothing in it;" yet, if we are to accept the theory of evolution, surely the frequency of these forms of variation in particular directions must have a significance.

"Among the Heterocera the number of species that fell to my lot was much smaller than I anticipated. During the earlier part of the time, *Zygæna filipendulæ*, L., was fairly common, and some specimens were in very good order, evidently not long from pupa; they were, as a rule, below the average size, and in the majority of them the spots were united in pairs. *Macroglossa stellatarum*, L., was on the wing in September; and on the 8th of that month I took a female *Hepialus sylvanus*, L., rather a late date, I believe, for this insect. The Noctuæ were not particularly well represented, the only species met with at all commonly being *Miana bicolora*, Vill. (*furuncula*, Tr.), which occurred in countless numbers and endless variety during the greater part of the time.

"Of the Geometræ, *Eupithecia oblongata*, Thnb., *Melanippe galiata*, Hb., *Eubolia bipunctaria*, Schiff., and *Aspilates ochrearia*, Rossi., were the most common. *Acidalia marginepunctata*, Göze., was in some numbers at rest on a rough stone wall on the sea front; and among them I secured one in which the inner two-thirds of the base of the fore wings are clouded with black. A few specimens of *Gnophos obscuraria*, Hb., that were obtained, showed no variation from the usual grey coast type.

"Among the micros, *Stenia punctalis*, Schiff., appeared in its usual numbers, and, as is generally the case at that time of year, in wasted condition. *Crambus geniculeus*, Haw., literally swarmed; and of a *Phycis*, probably *adornatella*, Tr., a few specimens were seen. The Pterophori were represented by *Pterophorus monodactylus*, L., of which a solitary example occurred on September 8th.

"Of the species that appeared to be less common than usual three are especially worthy of mention. *Bryophila muralis*, Forst., and *B. perla*, Fb., of which I found but one and three specimens respectively, although I searched dili-

gently for them at every suitable opportunity, and *Crambus tristellus*, Fb., which was quite a rare insect. With regard to the scarcity of this last I am unable to offer any explanation; but the small numbers of the two *Bryophila* noted may, I think, be to some extent accounted for. The walls on which they occur have for the most part not been built many years; in many instances they are covered with compo, thus affording but a poor footing for the lichens on which the larvæ of these species feed; and in addition to this, many of them, owing to their position on the sea front, receive the full force of the mid-day sun. It appears to me far from impossible that the unusually dry season may have deprived the lichens of the moisture necessary for their growth, and caused them to dry up; this would be especially the case during June and early July, the time when the sun has its greatest power, and also when the larvæ, being nearly full fed, would require the greatest amount of nourishment, and being deprived of it, they would die. Many of the walls that I examined, on which I knew that I ought to have found a considerable growth, appeared, while the dry weather lasted, to be bare of any covering save dry dust; but after the storm, before mentioned, which thoroughly saturated everything exposed to the weather, the lichens appeared to assume new life, and within a few days presented their usual appearance.

“Altogether my summer holiday could hardly be regarded as a success so far as the number of specimens captured was concerned, and the utter absence of many species that one would usually expect to meet with in the locality was disappointing; but such experiences, although they may not enrich our cabinets, may suggest material for future reflections, and thus not be time wasted.”

NOVEMBER 10th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. A. M. Keays, J. H. A. Jenner, F.E.S., and A. Robinson were elected members.

Mr. Tugwell exhibited English, Scotch, and Irish forms

of *Boarmia repandata*, L., the Scotch specimens from Rannoch, and the Irish specimens from Culleenamore.

Mr. J. A. Cooper exhibited a curious form of *Hadena dentina*, Esp., red forms of *Noctua glareosa*, Esp., and *N. castanea*, Esp.

Mr. H. H. Druce exhibited a melanic variety of *Vanessa urticæ*, L., taken in Mexico, the hind wings being almost black.

Mr. Sheldon exhibited a series of about 25 *Tephrosia biundularia*, Bork., from Derbyshire. The most noticeable variety was a specimen having the two right wings melanic, the left upper wing streaked with white, and the lower wing of a light colour.

Mr. J. A. Clark exhibited a number of *Polyommatus phlæas*, L., with preserved larvæ, and remarked that the eggs from which the specimens were bred were obtained from a female taken in Epping Forest; some of the larvæ pupated in the leaves on the ground, and some of them partly in the ground. The majority of the larvæ were not, as stated in Mr. Buckler's book, of a green colour, but had three pink stripes.

Mr. Mera exhibited varieties of *Arctia caia*, L., being examples of a second brood, the ova having hatched in June of this year. The specimens shown were stated to be the pick of 150.

Mr. Kenward also exhibited varieties of *Arctia caia*, L., one having yellow hind wings; and reference having been made to the remarks made by Mr. Slater on the occasion of a similar variety being exhibited at the meeting held March 10th last, Mr. Kenward stated that the larva from which the present specimen was bred had not been fed on leaves from the lime tree, but on the low growing plants which the species usually fed on in a state of nature.

Mr. West, Greenwich, exhibited *Dytiscus marginalis*, L., *D. circumflexus*, L., and *D. punctulatus*, L.

Mr. T. R. Billups exhibited *Astynomus ædilis*, L., from Chobham, and *Strangalia aurulentia*, F., taken at Warnham.

NOVEMBER 24th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. J. Reindorp and W. H. Whiffen were elected members.

Mr. Adye exhibited *Sphinx convolvuli*, L., *Catocala promissa*, Esp., *C. sponsa*, L., *Xylina ornithopus*, Rott., *X. semibrunnea*, Haw., and *X. socia*, Rott., all taken this year in the neighbourhood of the New Forest.

Mr. C. A. Briggs exhibited an aberrant female of *Arctia caia*, L. This specimen had the fore wings cream colour, with the usual brown replaced by darker cream colour everywhere except in the centre of the wing, where there were six small irregular brown spots, and another at the base, fringe light brown. Hind wings orange scarlet, with the usual dark blue spots replaced by faint orange-coloured ones. Body, orange scarlet, without the usual dark bands. On the U. S. all the wings are dark cream colour, shaded with pinkish orange, with three small dull black spots in the centre of each fore wing. Bred some years ago by the late C. H. Longley.

Mr. T. R. Billups exhibited a cocoon of a South American moth. The pupa was about the size of *Chærocampa porcellus*, L., and contained a large number of Chalcididous parasites, of the genus *L. micra*, in all 139 perfect specimens, 19 immature, and 9 larvæ—a total of 167 specimens, showing the enormous fecundity of this family of Ichneumonidæ.

And on behalf of Mr. Mosley, cases illustrative of the life histories of the Hessian Fly (*Cecidomyia destructor*, Say.), and of the Carrot Fly (*Psila rosæ*, Fab.), arranged for educational purposes.

Also, on behalf of Mr. Bignell, a case of galls and gall-flies, containing many rare species, including *Spathegaster baccarum*, Ol., *S. aprilinus*, Ol., *S. vesicatrix*, etc., *Ostreus fumipennis*, Ol., and *O. lenticularis*, Ol., *Aphilotrix sieboldi*, Hg., *A. radialis*, F., *A. corticis*, L., and *A. albopuncta*, F., and many others; and read the following notes:—

“There are many hundred forms of galls. The celebrated naturalist, Mayo, thirteen years ago, described and figured

ninety-six kinds on the oaks of Central Europe, all but two of them being produced by different species of gall-wasps.

"Of the nine orders belonging to the class Insecta, few contain gall-makers, Collembola, Thysanura, Orthoptera, and Neuroptera being the exceptions. The present known number of gall-making insects compares thus with Britain and the Continent of Europe:—

	Europe.	Britain.
<i>Cynipidæ</i>	128	58
<i>Tenthredinidæ</i>	12	8
<i>Tineina</i>	8	2
<i>Cecidomyidæ</i>	176	76
<i>Mycetophilidæ</i>	1	1
<i>Trypetidæ</i>	11	5
<i>Muscidæ</i>	5	2
<i>Curculionidæ</i>	12	8
<i>Aphididæ</i>	12	8
<i>Psyllidæ</i>	12	1

Mr. Fenn exhibited the following shells, collected by Mr. T. D. A. Cockerell on the Niagara River, a few hundred yards above the Falls, on the American side. *Planorbis bicarinatus*, Say., *Pisidium abditum*, Hald., *Limnæa palustris*, Mull., *Cochlicopa lubrica*, Mull., *Planorbis parvus*, Say., *Conulus fulvus*, Drap., and said that these six species belong to the circumpolar fauna, and are found in Europe and America, and all of them have occurred within a few miles of London, *Planorbis parvus*, for instance, in the Thames, and the other five species on Barnes Common.

He also exhibited Caddis cases of a doubtful species of *Helicopsyche*, a genus of Trichoptera, received from Mr. Cockerell, and read the following note:—

"The Caddis cases are from Divide Creek, Garfield County, where they were common on the under surface of boulders in the middle of the stream. Their resemblance to the shells of *Valvata* is extremely close, as anyone who is familiar with the common British *V. piscinalis*, or the American *V. sincera* will admit."

Mr. Step mentioned that among the collection of Fungi,

made by Messrs. Carrington and Billups at Esher, and shown at the Annual Exhibition, were three rare species, viz., *Polyporus schweinizii*, Fr., *Sparassis crispa*, Fr., and *Tremellodon gelatinosum*, Pers.

Mr. R. Adkin exhibited a series of *Spilosoma mendica*, Clerck., including males varying in ground colour from creamy-white to smoky-brown, and females of the usual white form, bred from ova from Co. Cork; males of the creamy-white shade taken at light at Antrim; and bred males and females of the usual English type, for comparison, and read the following notes:—

“This interesting form of the male *mendica* appears to have been unobserved in Ireland until within the last two or three years. It was brought to my notice in the spring of last year by my esteemed correspondent, Mr. H. McDowall, then residing at Passage West, Co. Cork, who very kindly sent me a couple of specimens; and having previously seen nothing at all resembling them from other districts I determined to investigate as far as possible so curious a case of dimorphism; and as my friend also sent me ova I was at once placed in a position to prosecute my inquiries. These ova agreed closely with some that I obtained from the London district for the purpose of comparison; in due course both lots hatched, and the larvæ were fed up in separate cages, side by side. I was curious to note whether so marked a difference in the imago would be in any way reproduced in the larva; but a close and frequent examination of them during the time they were feeding up, proved that it was not, and I could detect no greater difference between the two batches than between individuals of the one or the other; they pupated in a similar manner, and in the spring of the present year produced the specimens now exhibited.

“With regard to the distribution of this form in Ireland, Mr. McDowall informs me that the parent moth was taken in West Cork, flying over the herbage on a rocky hillside about ten o'clock on a June morning, and that the only other example that has come under his notice was a male of the creamy-white shade that was captured some thirty miles dis-

tant from the place where the female was taken, but in the same county. From the Rev. J. Gordon Holmes, of Antrim (to whose generosity I am indebted for the two males from that locality), I learn that during the months of May and June he took at "light" in Antrim three specimens in 1886 and five in the present year, one of which was almost pure white, and appears to agree with the variety that Hubner figures under the name of *rustica* (Hub., 1790, Vol. 2, plate 50, No. 150), and for which he gives the locality of Eastern Hungary. Mr. W. F. de V. Kane (who has very kindly furnished me with sundry notes on this subject) verifies another capture in Co. Cork, a male, resembling in shade the darkest of the Irish specimens exhibited, that was taken by Mr. Chas. Donovan in or before the year 1885. We have thus distinct records of this form of the male from the North-Eastern and South-Western counties; females have been taken in Co.'s Dublin and Waterford, but as they were not bred from, it is impossible to say to which variety they should be referred, and the species appears to be altogether unrecorded from the West. In the list of the Lepidoptera of Ireland, by Mr. Edwin Birchall, published in the Entom. Mo. Mag, 1866, *Mendica* is inserted with a note, "Mr. Greene's list," which would lead to the supposition that Mr. Birchall had no personal knowledge of its occurrence. This list referred to was drawn up by the Rev. Joseph Greene, and published, together with one by the Rev. A. R. Hogan, by the Dublin University Zoological and Botanical Association in or about the year 1857, and was, I am informed by Mr. Greene, compiled in a large measure from information supplied to him by others; and it is not unlikely that the capture or captures that led to the name appearing in the list may have been, like those from Dublin and Wicklow, females. We are, therefore, without any definite record of the usual black form of the male having been observed, and it appears to me to be exceedingly probable that the light-coloured male alone occurs in Ireland."

DECEMBER 8th, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. W. White, F.E.S., A. J. Hodges, T. H. Leech, F.L.S., F.Z.S., etc., G. H. Verral, F.E.S., F. Grut, F.L.S., F.E.S., F. J. Winkley, E. A. Waterhouse, H. A. Yardley, and G. B. Routledge, were elected members.

Mr. Sheldon exhibited examples of the spring and summer broods of *Scoparia angustea*, St., and stated that he found the larvæ of this species in the neighbourhood of Croydon early in February last, the imagines from which emerged in the following March. About the middle of August of the same year he again took the larvæ and pupæ of this insect in the same locality, the imagines emerging the same month. This was, therefore, conclusive evidence that the species was certainly double brooded in the Croydon district. The examples of the spring brood were more sluggish, and also much smaller than those of the summer brood.

Mr. Ince exhibited a comparative series of *Nepa cinerea*, L., and remarked on the variety in colour of the abdomen, ranging from red in some specimens to black in others.

The following note from Mr. T. D. A. Cockerell was read by Mr. Fenn:—

“From observations made during the last few months, it would appear that cases of mimicry are unusually prevalent in the Colorado Rocky Mountain Region, some of them being very remarkable. *Vanessa antiopa* is one of the commoner butterflies, but is nevertheless considerably exceeded in numbers by one of the *Locustidæ*, which it closely resembles on the wing. This grasshopper is nearly of the same size as the *Vanessa*, and has its lower wings of a black colour, with a broad yellowish-white border, the general effect of the coloration being similar to that of *V. antiopa*. Its manner of flight is also somewhat similar. Of course, on close examination the two insects appear totally different, and to anyone who has seen them in a cabinet only it may appear incredible that one could be mistaken for the

other; yet I have little doubt that this is a remarkable case of mimicry, either on the part of the *Vanessa*, the grasshopper being the more abundant of the two; or possibly (if it should prove that the latter is the most susceptible to the attacks of birds) a mimicry of the butterfly by the Orthopteron for the sake of protection; the resemblance being so close on the wing that I have more than once been deceived by it for a moment.

"It is favourable to the last of these suppositions, that all the *Locustidæ* are excessively variable in the colour of their wings, while *V. antiopa* is known to be very constant; also, it is hard to suppose that the *Vanessa*, first acquiring these protective colours in the region inhabited by this particular grasshopper, should have spread to Europe and other parts, and existed there for so long a time without losing in some degree its there useless peculiarity, which, after all, is unusual in the group to which it belongs.

"Further observations will, I hope, tend to clear up the question as to the precise relationship of these two insects; and meanwhile, as the case possesses some interest, I venture to bring the matter before the members of the Society, in the hope that they may be able to throw further light upon it, and particularly I would ask, is any similar case known in Europe?"

DECEMBER 22nd, 1887.

R. ADKIN, Esq., F.E.S., *President*, in the Chair.

Messrs. H. Hayward, F. E. Pow, F. S. Pilkington, M.D., W. R. Hickin, H. J. Smith, C. Kedgley, F. Livesey, E. A. Fitch, F.L.S., F.E.S., G. T. Porritt, F.L.S., F.E.S., J. A. Smith, W. Turpin, J. Butterfield, J. Eckersall, S. Mosley, W. Farren, and the Rev. Canon Fowler, M.A., F.L.S., F.E.S., were elected members.

Mr. C. B. Smith, who was present as a visitor, exhibited a lilac-coloured variety of *Lycæna icarus*, Rott., and an hermaphrodite specimen of *L. corydon*, Fb., taken at Blandford in July last.

Mr. A. C. Smith, who was also present as a visitor, exhibited a fine irradiated variety of the underside of *Lycæna icarus*, Rott.

The remainder of the evening was devoted to the Annual General Meeting for receiving the reports of the Council and Officers, and the election of Officers and Council for the year 1888, a list of whom will be found on the title-page of this part of the Proceedings.

VARIATION.

Read April 14th, 1887, by T. D. A. COCKERELL.

ALL the characters by which organisms are classified may be supposed to have arisen in variation, and being continued by transmission and fixed by natural selection, to have gradually become typical of a genus, species, family, or class.

Such peculiarities will have been, early in their history, inconstant, and easily influenced by external conditions, although their present condition is, in many cases, one of extreme constancy, even to the extent of proving harmful or absolutely destructive to the organism when new circumstances arise.

In classification, obviously, the most valuable and important characters are those which have been thus fixed, so that the old causes of their existence no longer influence them, or are necessary for their continuance, while new influences, which would perhaps have been unfavourable to their production, do not now materially affect them. Hence it has come to pass that most naturalists have hitherto studied only such characters as are so far independent of the influences that first formed them as to be constant under new conditions, and sufficiently so to be taken as typical of species or genera. Seeking the origin and cause of these fixed characters, it is often possible to show clearly enough how they are adapted to external circumstances, giving their possessors advantages in the struggle for existence in many ways; and from this it may be argued with sufficient reason that the cause of this or that peculiarity was the advantage it gave to the species, and its development on that account by natural selection. It is indeed as though one were looking at a picture, knowing nothing of the method of painting, yet noting how it represented familiar objects, reasoning that whoever painted the picture, and however it was done, the painter at least had those objects before him or in his mind at the time—that his desire to imitate them, in fact, was the cause of the result now seen upon the canvas.

Such a study, and such conclusions, are, so far as they go, interesting and valuable; but one feels some sense of dissatisfaction at these results alone, and seeks to know not only the broad reason of the change that has gradually taken place, but also the details of the process and the conditions under which it first occurred. These details, comparable in our analogy of the picture, to the mixing and laying on of the colours, their blending and changing in the progress of the work, one superseding another or mixing with it, changing its whole tone—all these may be traced in such forms as we call varietal, indicating thereby their inconstancy and susceptibility to the influence of new conditions of existence.

Generic and specific differences are nearly always, if traceable to their cause, found to have been or to be in some way useful to their possessors; but as regards varietal characters, I think it not unlikely that we shall, when we have a sufficiency of facts before us, be able to separate them into two broad classes, the progressive and the retrogressive. I think this distinction will have to be very carefully made, and that once decided in any case it will be all-important in the history of the form, since it will simply mean whether it is the commencement of a new and vigorous race, more favoured than its ancestors, or a sign that the species cannot surmount the difficulties of the new influences, and will lose vigour or succumb.

Having said so much, I will now try to put before you a few of the special kinds of variation that have most interested me, and endeavour, where I can, to point out their causes. Roughly, for convenience sake, we may take them under the heads of colour, form, size, and substance.

First of all, colour-variation. Little or nothing being known of the vast majority of animal pigments, it becomes more especially difficult to ascertain the manner in which these variations arise, or the immediate cause of their production. Perhaps the simplest form of variation under this head is *albinism*, or the lack of colour. Albinism, in some form or other, appears to occur almost universally throughout all classes of coloured organisms, and is doubtless in

some degree inherited. True albinism, I imagine, would be the non-development of pigment altogether, such cases as the white stoat in winter and the white mountain hare being of a different nature. Or, to take another illustration, a white man is not an albino, though true albinos, with white hair and pigmentless eyes do occur, both among the white and dark races of mankind. Albinos in the mammalia and birds are frequent, and I need not specify instances. Among the fishes I have note of white specimens of *Rhombus lævis* and *Pleuronectes flesus*.

With the mollusca it is by no means unusual to find specimens in which the colouring matter is entirely absent from the shell, and these albinisms are invariably found together, indicating that the peculiarity is transmitted to the young, though coloured specimens have been bred from albino parents.

The conditions that induce albinism in the shells of mollusca are at present unknown; albino varieties seem on the whole to be more prevalent on chalky soil than elsewhere; but here a question arises as to whether all these so-called albinos are truly so at all. To take a typical instance of what I mean—in *Hyalina cellaria* the usual form is pale brown—but there is a variety, not very uncommon, in which the shell is pale greenish, while another form has a milk-white shell. Now, many other species have what are called albino varieties, of the milk-white kind, and many others have colourless or pale-coloured semi-transparent ones; and at first sight it seems not improbable that the transparent forms are the only true albinos, lacking pigment altogether, and that the opaque white varieties owe their whiteness to some white pigment. Yet, on the whole, I am inclined to class them all as albinisms, and attribute the milk-white appearance merely to a deposit of carbonate of lime.

In a collection of shells I received some time ago from Kerry, I was much struck by the fact that, although there were specimens both of the coloured and pale or colourless forms of *Hyalina excavata*, *Pupa anglica*, and others, all the typical or coloured specimens were from the mainland, while

all the pale and albino forms came from Valentia Island and from Beginnis Island, close to Valentia. Also, in a collection from the great Skellig Island, twelve miles off the Kerry coast, there were numerous examples of *Hyalina alliaria*, nearly all of which were without pigment. Here, it may be, the exposed situation had something to do with the formation of these varieties; but never having visited the localities it is not easy to suggest what physical causes may have been at work in the matter.

I have not been able in any case to discover that albinism of the shell is of service to the individuals in which it occurs; on the contrary, in the case of *Helix aspersa*, I believe that the white examples are more easily seen, and so more often destroyed by birds.

Hence it would seem that albinism is, on the whole, retrogressive, scarcely, perhaps, equivalent to mere disease, because congenital, and transmitted, and not harmful to the constitution of the organism—due to some hitherto unexplained conditions, and arising under these conditions in any, or almost any, pigmented species.

Yet there is one genus at least in which—whatever its value to the species—albinism seems to have become a progressive and developing character. This is the genus *Hyalina*, to which I have already referred. In *Hyalina cellaria* and *H. nitidula*, white varieties are rare enough to be classed as aberrations or occasional sports; but *H. excavata* has the colourless form much more frequent, while *H. pura* is as common colourless as coloured, and lastly, *H. crystallina* is always and constantly albino. Here, certainly, it looks as though we had before us various stages in the development of white species from coloured ones, through the transmission of a peculiarity which first arose as a mere chance aberration.

These, that I have spoken of, are albinisms of the shell, in which pigment glands on the mantle have not developed, and so the shell has not been coloured; but albinisms do occur in the slugs, in which the pigment is quite wanting from the skin, such, for instance, was a pure white example

of *Limax agrestis* I found at Bedford Park, and a white *Testacella scutulum* found at Gibraltar, where the typical coloured form seemed not to occur.

Pascal described a very curious variety of *Limnæa palustris* found in France, in which the soft parts, instead of being darkly pigmented as usual, were semi-transparent and yellow, while the buccal mass could be seen through, of a vivid rose colour. This, apparently a case of non-development of pigment in the soft parts, though the shell was fully pigmented, remained unique, until my brother and Mr. F. G. Fenn went down to Herne Bay a year ago, and brought back a number of *Physa fontinalis* exhibiting precisely the same peculiarity of a transparent yellow animal, with the pink buccal mass showing through. It is notable that the albinism of the shell of *P. fontinalis* occurs at Herne Bay, but these with the pigmentless soft parts had normal coloured shells.

True albinisms among the Lepidoptera are very rare, though cases of pale patches on the wings and partial arrest of the development of pigment are not uncommon.

Specimens of *Epinephele ianira* and *E. tithonus*, in which the prevailing colours are sienna-brown, dark brown, and the black of the ocelli, will sometimes be found to lack entirely the last two pigments, leaving in their place a very pale ochre-yellow. Also, specimens are found in which brilliant and metallic colours are replaced by white, such as *Polyommatus phlæas*, var. *schmidtii* and *Lycæna corydon*, var. *albescens*. Then there are the pale females of *Colias*, such as *C. edusa*, v. *helice*, *C. erate*, v. *pallida*, and *C. aurora*, v. *chloe*, and also various pale local varieties which occur in both sexes. Probably these pallid varieties are caused, not by the absence of the pigment-elements, but an arrest in their development. Anyone who has bred *Geometra papilionaria* from the pupa cannot fail to have noticed the curious change that takes place from brown to green in the wing-pigment, while the insect is still within the pupa-case, but is just about to emerge. Similarly, *Pseudoterpna cytisaria* sometimes appears pale brownish, and sometimes green, and it is said that, all being at first brown, only those that emerge in fine weather

develop the green colour. Various Orthoptera, as the common *Blatta orientalis*, emerge from the pupal skin white or very pale, and only acquire the dark brown colour on the hardening of the epidermal tissues. So I think it not unlikely that the white patches in the *Satyridae*, the white spots on the New Forest *Argynnis paphia*, and perhaps most of the pale and semialbine forms have arisen, not because the pigment was absent—that is to say, could not have developed because the elements of its formation were wanting—nor because the once-formed pigment has been bleached in places, but because, from some at present unknown cause, there has been an arrest in the natural course of development of the colour-granules. In the vertebrata the remarkable and often localised effects of atrophy or disease of portions of the nervous system are well known, and it is just conceivable that some analogous cause may produce some of the effects I have described in the invertebrata; but such a theory seems at present impossible of proof, and so is, at the best, nothing more than a rather wild speculation, though it may be that some proof exists unknown to me.

There is no doubt, however, that animal pigments can and often do change materially after their formation; but such changes seem only to occur after the death of the part or the organism, or at any rate as a sign that the individual is beyond the period of the greatest vigour and fullest life.

Flowers, more especially yellow ones, as some of the *Cruciferae*, will fade white, and this process may not unlikely be one of the breaking up of a complex yellow pigment into some comparatively simple form that appears white, perhaps the same, or nearly the same, as is seen in those *Cruciferae* which normally have white flowers. Insects after death will fade considerably on exposure to light for a long period, and this, too, seems to be possibly due to a breaking up of the pigments into simpler compounds. Certain cases of paleness of colour or apparent albinism may be due to these causes, and it will be necessary to be very careful to discriminate between these and the true albinisms. For instance, *Helix nemoralis* has a white variety; but a long

series of this species in the British Museum, supposed to represent that variety, are every one of them bleached white, having been originally yellow!

Various chemicals, too, alkalis especially, will bleach or change the colour of animal pigments; ammonia, for instance, will change the white of some Lepidoptera to yellow; and in many ways it appears that the constitution of these pigments is very unstable, and that they are easily changed from one form into another.

A scarlet-red or pink pigment is very general through many classes of animals—I mean, for instance, the red of *Arctia caia* and the *Zygæna*; of some birds of the genus *Fringilla*, as the chaffinch; of the toad *Bombinator*; and of the bivalve shell *Tellina balthica*, and the gasteropod *Helix nemoralis*.

Now, in nearly every, if not every case, in which this peculiar red pigment occurs, there is an occasional variety in which the red is replaced by yellow; and further, there are very frequently normally yellow species in the same genus.

Arctia, for instance, has the species *caia*, which is normally red, but has a yellow aberration (such as those lime-fed ones we saw exhibited here at a former meeting), and *villica*, which is normally yellow, tinged on the abdomen and under side with red, except in the variety *fulminans* from Syria, which has the yellow of the underwings wholly replaced by red.

A variety of *Zygæna filipendulæ*, in which the red is replaced by yellow, is not very uncommon, and has been taken at Box Hill in our district, as well as at Cambridge and elsewhere. *Zygæna trifolii* has also presented a similar aberration; and a variety of *Chærocampa porcellus*, which might be called *lutescens*, having the pink replaced by yellow, was obtained in Perthshire. Similarly, in the genus *Sesia*, there are red-belted species and yellow-belted species, and a variety of *S. culiciformis*, in which the abdominal band is normally red, was found with a yellow band instead, thus resembling the normal colour of others of the genus.

Calligenia miniata, again, is normally pale red; but a variety was found at Lyndhurst in which the red was replaced by a bright lemon yellow.

Among the mollusca, *Tellina balthica* has both yellow and pink varieties; and *Helix nemoralis*, as is well known, is almost as frequently red as yellow, sometimes even commencing life as red, and after a certain period producing a new shell-growth of vivid yellow, as was the case in a young specimen I received from Truro; and it is notable that the yellow portion corresponded with the thickening of the shell and formation of a temporary lip after the first period of growth.

In the curious genus of toads called *Bombinator*, we have *B. igneus*, with a red belly, and *B. bombineus*, with a yellow belly, occurring in Europe; while it would appear that in Japan there occurs a species, similar in all respects to *B. igneus*, except that it has a yellow belly. Lastly, the red of the chaffinch (*Fringilla cælebs*) is sometimes replaced by yellow; and Mr. Jenner Weir told us here the other evening that redpolls, when bred in confinement, lost the red colour on their heads, and assumed yellow in its place.

What, then, is the meaning of all this? how is it that red pigment is so readily replaced by yellow, and by no other colour? perhaps an analogy from inorganic nature may help us. Take a solution of mercuric chloride or corrosive sublimate, and another of iodide of potassium, mix them carefully, putting not too much of the iodide, and you will get a scarlet-red precipitate—the red iodide of mercury—dry this carefully to a soft red powder, place some on a piece of paper, and warm it gently over a lamp; immediately it becomes of a vivid yellow, losing all trace of the original colour. Now scrape the yellow powder thus obtained with the blade of a knife; it at once resumes again its original scarlet colour, and appears as before.

What has happened is this: mercuric iodide has two forms, one red, the other yellow, both identical in composition, but differing presumably in some arrangement of the molecules at present unknown to us. The red form is the

most stable—probably the least complex—and is the usual form of the salt, but under certain conditions—those of heat—the yellow colour is assumed by a new arrangement, which, being unstable, readily breaks up into the red variety on friction. Suppose, now, that the red and yellow animal pigments described above are merely two forms of the same; and that the yellow being the simpler, the red develops only under certain conditions, which we do not know, and has a tendency, under unfavourable circumstances, even after it has become almost fixed by inheritance, to degenerate into the yellow form, as in the case of Mr. Jenner Weir's redpolls kept in confinement.

I think this analogy is not too far-fetched, and the facts seem to me to bear very strongly in its favour, though I would have many more facts recorded and many more careful experiments in breeding made before accepting this or any other speculations on so difficult a question as proved. One other important matter remains under the head of colour-variation, that of melanism, or in less degree, darkening and suffusion of the markings. This subject has been a good deal under discussion of late, and various theories of the cause of melanism have been brought forward. I, for my part, attribute it rather to some atmospheric influences—either directly to the effects of moisture in the air, or to something coincident with moisture. It seems possible, though I am not sufficiently a meteorologist to say whether it is so, that a moist atmosphere might hold in solution gases which a dry atmosphere would destroy or not absorb. If this is so, is it not conceivable that something of this kind may have a hand in the production of melanism? When a room is crowded with human beings more than it rightly should be, it is not unusual for each one there to go away with a violent headache, produced by the exhalations of the people in the room. Frequently, this is attributed to the effects of the carbonic acid gas given out in breathing; but experiment has shown that the quantity of this gas is by no means sufficient to produce the effects felt, and it is therefore necessary to suppose that some gas exists in the

human exhalations, too small in quantity to be discovered, yet sufficiently powerful to produce most noxious effects upon the constitution. Is it possible that some analogous phenomenon is the cause of melanism, that some gas is present in minute quantities in moist atmospheres, perhaps produced by chemical combination from other and harmless gases, and this is powerful enough to darken the pigment of animals and produce melanism? or should we attribute it to the direct effects of moisture alone, or to some other cause?

Examples under the head of melanism are quite familiar to you, and I will not enumerate them, but mention only one case that struck me a good deal when I first read of it. It is the *Arvicola amphibia*, var. *ater* MacGillivray, or the Black Water Vole. This variety differs only from the type in being black instead of brown, in fact, a melanic form. It occurs commonly in some of the northern counties of Scotland, where the brown typical form is rare; while in the south of Scotland and some parts of England it is found rarely, the brown being the prevalent form in those districts. Surely this variety, considering its geographical distribution, must be classed with Scotch melanism generally, as due, probably at any rate, to the same cause; yet considering the habits and nature of the animal, it is not very easy to imagine how the same cause could have so influenced water-vole, slugs and Lepidoptera.

I have said so much about colour varieties that there is hardly time to speak of varieties of form, size, and texture and I will therefore be as brief as possible. Of form-varieties one of the most curious is that of reversion of the normal position of the parts in species in which the sides are not alike; for instance, some men have their hearts on the right instead of the left side, with the other organs correspondingly reversed. Reversed flat fish are sometimes taken; the peculiarity has occurred for instance, in *Solea vulgaris*, *Rhombus levis*, *R. maximus*, and *Pleuronectes flesus*. Shells of Gastropods, in which the spire is dextral, will have sinistral aberrations; and others, in which the spire is normally sinistral,

present dextral specimens, though these are very rare. Bivalve shells, too, sometimes have the valves reversed, and with them of course the soft parts of the animal. The curious thing about these reversed varieties, at any rate among the Gasteropoda, is that the peculiarity is not only transmitted to the offspring, thus producing colonies of sinistral-shelled forms, but that the localities in which one species is found reversed, generally produce similar aberrations in allied species also. At first sight it seems natural enough that a peculiarity should occur in any district in all allied species, rather than in any one alone; but when we consider that this is a variety that arises, and can only arise, in the earliest stages of the embryo, and cannot be altered or influenced by its external influences after its formation, it does seem most remarkable that one spot on the Yorkshire coast should produce reversed examples of two species of *Helix*, and that a single lane near Bristol should be peculiar for the occurrence in it of several sinistral examples both of *Helix aspersa* and *H. hortensis*.

Varieties of size arise generally from unusually favourable or unfavourable conditions. Dwarfed varieties occur where food is scanty and the conditions of life are bad; and if you want a good example of that you need only examine the poorer parts of London, and observe the effects of ill-circumstances on our own species, how that the average height and weight is less than normal, and monstrosities are common, and the average age is less than thirty years; not by any means because they are fittest to survive so, but because the circumstances are so ill-suited to the species, that although they do not cease to live, they live only half a life, or less.

So again, observe the pond-snails, *Limnæa stagnalis*, in a little pond on Chislehurst Common, crowded together, lacking food, so that one day when an old newspaper was blown into the pond, they immediately set to and devoured it, for it was the best food they could get. These snails, what with the crowding and the lack of food, are dwarfed, scarcely half the normal size of the species, and some of them are distorted into a curious scalariform monstrosity—analogous, I imagine,

to the disease called rickets, that is prevalent among human beings under corresponding circumstances.

Lastly, varieties of texture: these are generally the direct result of physical conditions, and have no very great importance; shells found in limestone districts are for instance thicker than those on other soils, on the average. Some, from their inability to procure or assimilate carbonate of lime, will be thin, fragile, and almost membranous; and like results arise in other animals from similar causes. One word at the end in defence of the much-abused varietal names. I would not hesitate to apply a name to any variety of sufficient distinctness to be recognised, nor do I quite understand why one should not do so. People say, how shall we remember all these names?—but what they mean is, I won't bother to study the characters of these varieties; for you may be sure that they could not get on without the names if they wished to speak and write of varieties. Take our own species, in which we have actually named every individual! isn't that horrible—what a *host* of names—how are we to remember them? Well, we remember those we like, and for the rest, their names serve as a surer means of finding them than any description. If you ask me to find you Ebenezer McNabbles, I look him up in the directory, which corresponds to a hand list of species and varieties, and probably enough I find him; but, if you tell me of a tall man, with a long beard, short hair, green eyes, a pimple on his nose, and so on, I am likely to wander about some time and make many enquiries before I come across him, if I do so at all. So it is with varieties; one can remember a variety once seen, and associate it with a certain name—and others can do the same; but the imperfections of language are far too great to make it convenient or even possible to go on the principle of describing a thing every time it is mentioned, not to speak of the waste of time and space in so doing.

Now I have finished. The subject is so extensive that I have been able only to skim over the surface of a few aspects of it, and touch upon one or two questions that had presented themselves to me. I look forward to the light that you, who

have had more experience than I, will be able to throw upon these matters, and hope that some of the difficulties that have appeared to me, and doubtless to others, may be cleared up in the discussion to-night.

LIST OF MEMBERS.

YEAR OF ELECTION.

- 1882 ADKIN, R., F.E.S., Wellfield, Lingards Road, Lewisham, S.E.
- 1886 ADKIN, B. W., Brandon House, Morden Hill, Lewisham, S.E. ✓
- 1886 ADYE, J. M., Somerford Grange, Christchurch, Hants. ✓
- 1888 AULD, H. A., 2, Plassy Road, Catford, S.E. ✓
- 1887 BARCLAY, F. H., Leyton, Essex.
- 1884 BARKER, H. W., F.E.S., *Hon. Sec.*, 83, Brayard's Road, Peckham, S.E.
- 1887 BARREN, H. E., 46, Lyndhurst Road, Peckham, S.E.
- 1886 BEAUMONT, A., F.E.S., 30, Ladywell Park, Lewisham, S.E. ✓
- 1888 BILLUPS, P. C. C., M.D., 163, Friern Road, East Dulwich.
- 1877 BILLUPS, T. R., F.E.S., *President*, 20, Swiss Villas, Coplestone Road, Peckham, S.E.
- 1886 BLANDFORD, W. F., Trinity College, Cambridge.
- 1874 BLISS, A., F.E.S., Pennenis, Trewsbury Road, Sydenham, S.E. ✓
- 1873 BOLGER, H. L., The Tiger's Head Inn, Chiselhurst, Kent.
- 1887 BOUTTELL, C. S., 7, Irene Road, Fulham, S.W.
- 1886 BRADY, C., 3, Tanners End, Edmonton, N.
- 1887 BRIGGS, C. A., F.E.S., Surrey House, Leatherhead, Surrey. ✓
- 1887 BRIGGS, T. A., M.A., F.E.S., Surrey House, Leatherhead, Surrey.
- 1887 BUTTERFIELD, J., 110, Lewisham Road, S.E. ✓
- 1886 CARPENTER, J. H., 15, Loughborough Road, Brixton, S.W. ✓
- 1877 CARRINGTON, J. T., F.L.S. *Vice-President*, New Broad Street House, New Broad Street, E.C.
- 1872 CHAMPION, G. C., F.E.S., 11, Caldervale Road, Elm Park, Clapham, S.W. ✓
- 1872 CHANEY, W. C., 96, Bird in Bush Road, Peckham, S.E. ✓
- 1887 CLARK, J. A., F.E.S., The Broadway, London Fields, E. ✓

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ELECTION.

- 1879 CLODE, W., 47, Phillimore Gardens, Campden Hill, W. (*Life Member*). ✓
- 1886 COCKERELL, T. D. A., West Cliff, Custer Co, Colorado, U.S.A.
- 1876 COLE, W., F.E.S., Laurel Cottage, Buckhurst Hill, Essex. ✓
- 1884 COLLETT, E. P., F.E.S., 19, St. John Street, Manchester. ✓
- 1887 COLLINGS, H., 30, Wickham Road, St. John's, S.E.
- 1884 COOK, A. E., 31, Lower Road, Rotherhithe, S.E.
- 1884 COOPER, J. A., 1, Sussex Villas, Harrow Road, Leytonstone. ✓
- 1885 CROKER, A. J., 33, North Street, New Cross, S.E. ✓
- 1886 DAY, G., 19, Garlick Hill, E.C.
- 1887 DISTANT, W. L., F.E.S., M.A.I., 1, Russell-hill-road, Purley, Surrey. ✓
- 1884 DOBSON, H. T., 3, Sycamore Villas, New Malden, Surrey. ✓
- 1884 DOWNING, J. W., 59, Lupus Street, Pimlico, S.W.
- 1887 DRUCE, H. H., 43, Circus Road, St. John's Wood, N.W.
- 1886 DUNNING, J. W., M.A., F.L.S., F.Z.S., F.E.S., *Patron*, 12, Old Square, Lincoln's Inn, W.C.
- 1886 EDWARDS, S., F.E.S., Kidbrooke Lodge, Blackheath, S.E. ✓
- 1877 ELISHA, G., F.E.S., 122, Shepherdess Walk, City Road, E.C. ✓
- 1886 ENOCK, F., F.E.S., 12, Parolles Road, Upper Holloway, N. ✓
- 1887 FARREN, W., 14, King's Parade, Cambridge. ✓
- 1887 FENN, F. G., Syon Lodge, Isleworth. ✓
- 1872 FICKLIN, A., Norbiton, Surrey. ✓
- 1887 FITCH, E. A., F.L.S., F.E.S., Brick House, Maldon.
- 1887 FLETCHER, W. H. B., M.A., F.E.S., Fairlawn House, Worthing, Sussex.
- 1887 FOWLER, The Rev. Canon, M.A., F.L.S., F.E.S., The School House, Lincoln.
- 1886 FREMLIN, H. S., 1, Margaret Street, Cavendish Square, W. ✓
- 1886 FROHAWK, F. W., 9, Downton Road, Balham, S.W. ✓
- 1884 GIBB, L., 185, High Street, Lewisham, S.E. ✓
- 1886 GIBBS, T., Jun., Bretby, Burton-on-Trent. ✓
- 1885 GODWIN, F., 88, Carlisle Street, Edgware Road, W.
- 1885 GOLDTHWAITE, O. C., 2, Grove Villas, Grove Road, Walthamstow. ✓

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1886. HALL, T. H., 35, Thorne Road, Albert Square, Clapham, S.W.
1884. HALL, T. W., F.E.S., 3, New Inn, W.C. ✓
1888. HAWES, F. W., 14, Dovecote Villas, Wood Green, N. ✓
1887. HAYWARD, H., 53, Fenwick Road, Peckham, S.E. ✓
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1886. HENDERSON, J., 58, Romola Road, Herne Hill, S.W. ✓
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1887. JENNER, J. H. A., F.E.S., 4, East Street, Lewes, Sussex.
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1887. JOHNSON, Rev. W. F., Winder Terrace, Armagh, Ireland. ✓
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1887. KEAYS, A. M., A.S.T.E., M.S.A., 11, Burch Road, Rosherville, ✓
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1884. KENWARD, J., 5, Carlton Road, Sidcup. ✓
1888. KNIGHT, E., 2, Lichfield Grove, Finchley, N.
1887. LEA, JOHN, 2, Elm Villas, Elm Row, Heath Street, Hamp-
stead, N.W.
1887. LEECH, T. H., B.A., F.L.S., F.Z.S., F.E.S., F.R.G.S., 10,
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1884. LEVETT, C., 104, Malpas Road, Brockley, S.E., ✓
1887. LIVESAY, F., Thames Street, Greenwich, S.E.,
1888. LLOYD, J. E., Russell Place, Russell Street, Bermondsey, S.E.
1885. LOWRY, P. H., 8, Winslade Road, Brixton Rise, S.W.
1872. LUBBOCK, Sir JOHN, Bart., M.P., D.C.L., F.R.S., F.L.S.,
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1886. MANGER, W., 100, Manor Road, New Cross, S.E. ✓
1888. MARTIN, W., 21, Longley Street, Southwark Park Road, S.E.
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1888. MATTHEWS, J. C., Erme Wood, Ivybridge, South Devon.
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Calcutta, India.
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1888. MONTAGUE, C. J., 4, Bedford Square, Commercial Road, E.
1880. MONTIERO, Senor A. DE C., F.E.S., 72, Rua do Alacrine,
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1872. OLDHAM, C., 2, Warwick Villas, Chelmsford Road, Woodford.
1884. PEARCE, A. E., 1, Ildersley Grove, West Dulwich, S.E.
1888. PEARCE, J., 4, Borough High Street, Borough, S.E.
1888. PEARCE, J. E., " " " "
1883. PEARCE, W. A., Lyndhurst, Croxted Road, West Dulwich,
S.E.
1880. PERKINS, V. R., F.E.S., Wotton-under-Edge, Gloucestershire. ✓
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1887. PILKINGTON, F. S., M.D., 18, Trinity Square, Borough, S.E.
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1886. POWLEY, W., M.A. Cantab., Whitton Villa, Hounslow. ✓
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1886. RENDALL, P., M.D., Bathurst, Gambia.
1887. RICE, D. J., *Hon. Librarian*, 22, Methley Street, Kennington, ✓
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1886. RICKETTS, M., 61, High Street, Gravesend, Kent. ✓
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1888. ROOTS, W., 208, Gt. Dover Street, Borough, S.E.
1887. ROUTLEDGE, G. B., 50, Russell Square, W.C. ✓
1888. RUNNACLES, C. E., 12, Tubbs Road, Willesden, N.W.
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1886. SABINE, E., 22, The Villas, Erith.
1886. SHAW, A. E., F.E.S., 13, Lanhill Road, Paddington, W.
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S.E.
1886. SHELDON, W. G., Rose Cottage, Oval Road, Addiscombe, ✓
Surrey.
1886. SKINNER, G., 31, Motley Street, Wandsworth Road, S.W.
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1887. SMITH, J. A., 22, St. Mary's Road, Peckham, S.E.
1882. SOUTH, R., F.E.S., 12, Abbey Gardens, St. John's Wood, N.W.
1886. SPANTON, A. W., Ellerslie, Eltham Road, Lee, S.E.
1872. STAINTON, H. T., F.R.S., F.L.S., F.G.S., F.E.S., &c., *Patron*, ✓
Mountsfield, Lewisham, S.E.
1873. STANDEN, R., The White House, Alby, Norfolk (*Life Member*). ✓
1872. STEP, E., *Hon. Treasurer*, The Mays, Ladbroke Road, Epsom, ✓
Surrey.

YEAR OF
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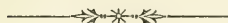
1888. STEVENS, L., Lower Road, Deptford, S.E.
1872. STEVENS, S., F.L.S., F.E.S., Loanda, Beulah Hill, Norwood, S.E. ✓
1886. STOREY, A. T., 10, Woodstock Road, Bedford Park, W.
1887. STRINGER, J., Bulwer Road, New Barnet.
1888. STRONG, F. E., 16, Lordship Park, South Hornsey, N.
1873. TUGWELL, W. H., M.P.S., *Vice-President*, 6, Lewisham Road, Greenwich, S.E.
1887. TURNER, H. J., *Hon. Assistant Secretary*, 13, Drakefell Road, St. Catherine's Park, S.E. ✓
1887. TURPIN, W., 9, York Street, Southwark, S.E.
1886. TUTT, J. W., F.E.S., Rayleigh Villa, Westcombe Park, Blackheath, S.E.
1881. URWICK, W. F., Clapham Common, S.W.
1887. VERRALL, G. H., F.E.S., Sussex Lodge, Newmarket.
1880. WALKER, J. J., R.N., F.E.S., 23, Ranelagh Road, Marine Town, Sheerness. ✓
1886. WALSHINGHAM, THOMAS DE GREY, The Right Hon. Lord, M.A., F.R.S., F.L.S., F.Z.S., F.E.S., etc., *Patron*, Eaton House, Eaton Square, S.W.
1888. WARNE, W. F., 8, Bedford Square, W. ✓
1888. WARNE, N. D., 8, Bedford Square, W.
1887. WATERHOUSE, E. A., 23, Spencer Road, Putney, S.W.
1886. WATSON, C. H., 4, Auckland Villas, Gipsy Road, West Norwood, S.W.
1872. WEIR, J. J., F.L.S., F.Z.S., F.E.S., Chirbury, Copers Cope Road, Beckenham, Kent. ✓
1872. WELLMAN, J. R., 8, Medora Road, Brixton Rise, S.W.
1872. WEST, W., *Hon. Curator*, 8, Ravensbourne Terrace, Lewisham Road, S.E. ✓
1878. WEST, W., L.D.S., Cyprus Villa, Lewin Road, Streatham Common, S.W. ✓
1887. WHIFFEN, W. H., 49, Granville Park, Lewisham, S.E.
1887. WHITE, W., F.E.S., 4, Mecklenburg Square, W.C. ✓
1884. WILKINSON, S. J., 22, Richmond Terrace, Clapham Road, S.W.

YEAR OF
ELECTION.

1872. WILLIAMS, J. T., 5, Woodland Villas, Fooks Cray, Kent.
 1886. WINDYBANK, A. J.,
 1887. WINKLEY, F. J., 4, High Street, Borough, S.E.
 1886. WRIGHT, W. H., Secretary's Department, Somerset House,
 Strand, W.C.
 1887. YARDLEY, H. A., 4, Borough High Street, S.E.

As it is intended in future issues to classify this list, Members will greatly oblige by informing the *Hon. Sec.* of the particular branch of Natural History they study; also of any errors or alterations in their addresses and descriptions.

CATALOGUE OF WORKS IN THE LIBRARY.



BOTANY.

Brewer, J. A.....	Flora of Surrey.
Coleman, W. S.....	Our Woodlands, Heaths, and Hedges.
Cooke, M. C.	Rust, Smut, Mildew, and Mould. Microscopic Fungi.
Darwin, Chas.	Animals and Plants under Domestication.
„	The Fertilisation of Orchids.
De Crespigny, E. Ch.	A New London Flora.
Fitzgerald, H. P.....	A Dictionary of British Plant Names.
Henslow, G.....	Floral Dissections.
„	Floral Structures.
Lubbock, Sir J.	British Wild Flowers in Relation to Insects.
Oliver, D.....	Elementary Lessons in Botany.
	Plant Life.
Pratt, Anne	Flowering Plants, Ferns, and Grasses of Great Britain.
Stark, R.	A Popular History of British Mosses.
Thomson, A. T.	Lecture on the Elements of Botany.
Trouessart, E. L.....	Microbes, Ferments, and Moulds.
Unwin, W. C.	Genera of British Mosses.

ENTOMOLOGY.

Bath, W. H.	Ants, Bees, Dragon-flies, Earwigs, Crickets, and Flies.
Buckler, W.	Larvæ of British Lepidoptera.
Cameron, P.....	A Monograph of British Phytophagous Hymenoptera.
Chenu, Dr.....	Histoire Naturelle Coleoptera.
Cox, H. E.	Handbook of Coleoptera.
	Catalogue of British Hymenoptera in the British Museum :
	part I. Andrenidæ and Apidæ.
Dawson, J. F.	Geodephaga Britannica.

- Dejean, D.M. le Comte Catalogue des Coleoptères.
 „ Species generale des Coleoptères.
 Douglas & Scott British Hemiptera-Heteroptera.
 Douglas, J. W..... The World of Insects.
 „ Accentuated List of British Lepidoptera.
 Greene The Insect Hunter's Companion.
 Hope, F. W. Coleopterist's Manual, part II.
 Horsfield, Th. Catalogue of East India Lepidoptera.
 Humphery, N..... British Butterflies.
 Kane, W. F. de V. ... European Butterflies.
 Kirby & Spence Introduction to Entomology.
 Knaggs, H. G..... Lepidopterist's Guide, (2 copies).
 Lacordaire, M. Th... Genera des Coleoptères.
 Lowne, B. T. The Anatomy of the Blow-fly.
 Lubbock, Sir J. Ants, Bees, and Wasps.
 „ A Monograph of the Collembola and Thysanura.
 „ The Origin and Metamorphoses of Insects.
 Merrin, J. Lepidopterist's Calendar.
 Morris, F. O. British Moths.
 McLachlan, R..... A Monograph of the European Trichoptera.
 Newman, E..... British Butterflies.
 „ The Insect Hunters.
 „ A History of Insects.
 „ British Moths.
 Ormerod, E. A. A Manual of Injurious Insects and Methods of Prevention.
 „ Natural History of Wasps.
 Packard, A. S..... A Guide to the Study of Insects.
 Porritt, G. T. List of Yorkshire Lepidoptera.
 Rye, C. E. British Beetles.
 Saunders, E..... Synopsis of British Hemiptera-Heteroptera.
 Scott See Douglas & Scott.
 Shuckard, W. E.... .. Burmeister's Entomology.
 „ Fossorial Hymenoptera.
 Smith, S. F..... .. British Hymenoptera.
 Spence See Kirby & Spence.
 Spry & Shuckard British Coleoptera Delineated.
 Stainton, H. T. A Manual of British Butterflies and Moths.
 „ Tinæina. (Insecta Britannica); Vols. II. & III.
 Staudinger..... Catalogue of European Lepidoptera.
 Stephens, J. F..... A Manual of British Coleoptera.
 „ Haustellata. Vol. I. (British Entomology).
 „ Mandibulata. Vol. I. „ „

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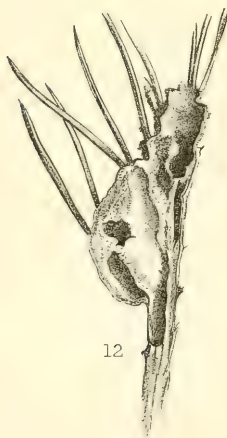
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1888-1889

THE SOUTH LONDON
Entomological & Natural History Society

(Established 1872),

Hibernia Chambers, London Bridge, S.E.



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* *To whom all Communications should be addressed.*

1888-1889

125618

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY,

HIBERNIA CHAMBERS, LONDON BRIDGE, S.E.

The Society has for its object the diffusion of Biological Science, by means of Papers and Discussions, and the formation of Typical Collections. There is a Library for the use of Members. Meetings of the Members are held on the 2nd and 4th Thursday evenings in each month, from Eight to Ten p.m., at the above address. The Society's Rooms are easy of access from all parts of London, and the Council cordially invite the co-operation of all Naturalists, especially those who are willing to further the objects of the Society by reading Papers and exhibiting their Specimens.

SUBSCRIPTION.

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1889 ... ,,

REPORT, 1888.

THE Council can again congratulate the members on the satisfactory progress which has been made during the year. When the Report for 1887 was read there was a membership of 148. During the present year two members have been struck off the roll of membership, and one other has resigned. Against this loss of three members no less than fifty-five have been elected, making the total number now on the Society's books exactly 200.

About the beginning of April, at the suggestion of Mr. Coryndon Matthews, it was decided by the Council to offer greater facilities to country members, and for this purpose a Committee was appointed to arrange the necessary details, some of which it was found would have to be submitted to a General Meeting of the members, and this was accordingly done on the 26th of April, 1888. It was ultimately arranged that, under certain conditions, all country members should have, among other privileges, those of using the books belonging to the Library, and, as far as was possible, the identification of specimens. Since this became known we have elected fourteen country members, many of whom have sent exhibits and notes to the meetings, and others have availed themselves of the opportunity of getting specimens named.

The financial position, as will be seen by the Treasurer's Balance-Sheet, is thoroughly sound, there being a larger balance in hand than at any previous time in the Society's history.

The additions to the Library for the year are as follows:—

“The Entomologist” and “The Zoologist” for 1888, from Mr. NEWMAN.

“The Entomologist's Monthly Magazine” for 1888, from Mr. MCLACHLAN.

“The Essex Naturalist” for 1888, from the ESSEX FIELD CLUB.

“The Young Naturalist,” from Mr. J. E. ROBSON,

The “Garner,” for 1888, “Floral Structures” (Henslow), “The Mammalia” (Schmidt), “Anthropoid Apes” (Hartman), “Hogg on the Microscope,” Frames for the original drawings of the Society’s Plates, and of the Great Auk’s Egg, from Mr. T. R. BILLUPS.

“Animals and Plants under Domestication” (Darwin), “Origin of Species” (Darwin), and “Microbes, Ferments, and Moulds” (Trouessart), from Mr. R. ADKIN.

“Paper on *Sphinx pinastri*,” “The Illustrated Manual of British Birds,” Part I, and “Handbook of Coleoptera” (Cox), from Mr. JOHN T. CARRINGTON.

“A Naturalist’s Voyage Round the World” (Darwin), and “The Fertilization of Orchids” (Darwin), from Mr. W. H. TUGWELL.

“Report on Pedigree Moth Breeding,” by Mr. Merrifield, from the AUTHOR.

“The West American Scientist,” and the “Canadian Entomologist,” from Mr. T. D. A. COCKERELL.

“European Butterflies” (Kane), and “Our Summer Migrants,” from Mr. F. G. FENN.

“Pallas’ Sand Grouse” (Tegetmeier), from the AUTHOR.

“The English Entomologist,” 1792 (Thomas Martin), from Mr. S. J. WILKINSON.

“Seventeenth Annual Report of the South London Microscopical Society,” from the SOCIETY.

“Report of the West Kent Natural History, Microscopical, etc., Society,” 1887-8, from the SOCIETY.

“Transactions of the County of Middlesex Natural History Society,” from the SOCIETY.

Obligation Book, from Mr. LACHLAN GIBB.

Attendance Signature Book, from Messrs. TURNER and BARKER.

And by Purchase :—

“The Year Book of Scientific Societies for 1888,” and
“Science Gossip,” for 1888.

By the kindness of Mr. ADKIN, who put the Council in the way of obtaining a much larger book-case at a small cost there is now plenty of accommodation for the books; and thanks to the efforts of Mr. CHANEY, the late Librarian and Mr. RICE, who now fulfils those duties, a Catalogue of the Books in the Society’s possession was issued with the Abstract of Proceedings for 1887.

The Collections are still under the able care of Mr. WEST (Greenwich), and he has now prepared a list of *desiderata*, and it is hoped that members will render what assistance they can to make the Collections as complete as possible.

The Abstract of Proceedings for 1887, published in 1888, contains two plates and 127 pages of printed matter. The Society is indebted to Messrs. R. ADKIN and R. SOUTH for Plate 1, and Plate 2 was presented by Messrs. T. R. BILLUPS and W. A. PEARCE.

The Excursions during the year were five in number as follows :—

May 12—Zoological Gardens, Regent’s Park.

Conducted by Mr. J. Jenner Weir.

May 26—Horsley, Surrey.

Conducted by Mr. Helps.

June 23—Weybridge, Surrey.

Conducted by Mr. J. T. Carrington.

July 14—Westerham, Kent.

Conducted by Mr. J. T. Carrington.

September 22—Kew Gardens, Surrey.

Conducted by Mr. T. R. Billups.

October 13—Esher, Surrey (Fungus Outing).

Conducted by Mr. E. Step.

The Annual Exhibition was held on the 17th and 18th October, the first night being considered a private view, for which a limited number of tickets were issued at a charge of

1s. each; of these 411 were sold, and realized £20 11s., a sum sufficient to cover all the expenses. On the second evening, when the Exhibition was open free by complimentary ticket, there was an attendance of about 1,700.

In connection with the Exhibition, the Council thought it expedient to ask members to guarantee a fund which would be sufficient to cover the probable cost of such Exhibition. The required amount was at once promised; and the Council wish to tender their thanks to the members who volunteered their support to the fund, which, however, owing to the large sale of tickets, was not drawn upon.

At a meeting held in December, 1887, a resolution was passed, and a Committee appointed to revise the Rules of the Society. Such Committee afterwards submitted their Report to a General Meeting of members on the 9th February, and, with some alterations, their recommendations were adopted.

Mr. LACHLAN GIBB was good enough to present the Society with an Obligation Book, and some other friends presented an Attendance Signature Book. The Council beg to ask all members who have not yet signed the former book to do so as soon as possible, and also when present at any meeting not to omit to sign the Attendance Book, as it is very desirable that as full a record as possible of the attendance at meetings should be kept.

H. W. BARKER,
Hon. Sec.

PLATE I.



- Fig. 1. *Lycæna bellargus*, Rott. (var.)
 „ 2. *Lycæna icarus*, Rott. (var.)
 „ 3. *Argynnis euphrosyne*, L. (var.)
 „ 4. *Tephrosia biundularia*, Hb.
 „ 5. } Wings of *Argynnis paphia*, L., partially desquamated.
 „ 6. }
 „ 7. *Penthina pruniana*, Hb., var. *nubiferana*, Haw.
 „ 8. *Melanippe fluctuata*, L. (var.)
 „ 9. *Eubolia bipunctaria*, Schiff.
 „ 10. }
 „ 11. } *Pellenes tripunctatus*.
 „ 12. *Retinia resinella*, L. Sectional view of interior of resinous
 nodule in which the larva feeds.
 „ 13. Exterior of same with empty pupa case protruding.
 „ 14. *Apanteles rubripes*, Hal.
 „ 14a. Larva of *Geometra papilionaria*, L., with cocoons of *Apanteles rubripes*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

BALANCE SHEET FOR THE YEAR 1888.

GENERAL FUND.

<i>Receipts.</i>		<i>Expenditure.</i>	
	£ s. d.		£ s. d.
To Balance from last Audit, Dec. 22, 1887	7 0 2½	By Rent	12 12 0
" Subscriptions, Entrance Fees, and Arrears....	66 10 6	" Postage, Stationery, & Incidental Expenses	9 13 6½
" Admission to Private View, Annual Exhibition	20 11 0	" Printing	5 1 6
		" Transfer to Publication Fund	20 0 0
		" Library	1 8 0
		" Annual Exhibition	20 8 9
		" Insurance	0 7 0
		" Balance in hand	24 10 11
	<u>£94 1 8½</u>		<u>£94 1 8½</u>

PUBLICATION FUND.

<i>Receipts.</i>		<i>Expenditure.</i>	
	£ s. d.		£ s. d.
To Balance	1 6 0	By Cost of Report and Proceedings for 1887	31 8 10
" Special Donations	11 18 4	" Balance	3 15 6
" Transfer from General Fund, as per vote of Council	20 0 0		
" Sale of Proceedings	2 0 0		
	<u>£35 4 4</u>		<u>£35 4 4</u>

LIBRARY FUND.

<i>Receipts.</i>	£	s.	d.	<i>Expenditure.</i>	£	s.	d.
To Balance	1 2 4	By Balance ...	...	...	...
" Book Fines	0 14 0		...	...	2 6 10
" Donation	0 10 6				
			£2 6 10				£2 6 10

<i>Assets.</i>	£	s.	d.	<i>Liabilities.</i>	£	s.	d.
To Balance, General Fund ...	...	24 10 11		By Rent due...	...	...	...
" Publication Fund	...	3 15 6		" Amount due on Book-Case ...	...	...	3 3 0
" Library Fund	...	2 6 10		" Balance of Assets over Liabilities	...	...	4 4 0
							33 10 9
Total Cash Balance	...	30 13 3					
Estimated Realisable Proportion of Subscription in Arrear	...	10 4 6					
			£40 17 9				£40 17 9

Audited, compared with Vouchers, and found correct, January 17th, 1889.

THOS. W. HALL, }
W. G. SHELDON, } *Auditors*

PRESIDENTIAL ADDRESS, 1888.



GENTLEMEN,

There is an old adage that time and tide wait for no man ; and this is my experience. Finding myself at the termination of another year, I feel that I must in the first place tender you my warmest gratitude, for your kind and indulgent forbearance to me during the last twelve months. It has been impossible for me through circumstances over which I had no control, to attend your meetings with the regularity I could have wished. I have to thank my colleagues for their careful attention to the affairs of the Society, and especially the Secretary and Vice-Presidents, who have been good enough to conduct the meetings during my enforced absence. We may, I think, fairly congratulate ourselves that the Society continues to make steady progress, and that it is not only in a very vigorous and healthy condition, but also more prosperous than at any previous period of its existence. Although we have lost some two or three members from varied causes, we have elected 55 new ones to take their place, and our membership now stands at 200. This is, I think, a source of great satisfaction to us all. But we must not be content to rest upon our laurels. Our motto must be large reinforcements and fresh importations ; and is it too much to expect that the energy of this large body of members, if fully aroused, will make up a permanent addition of another hundred by our next Annual Meeting ? I will be sanguine enough to hope so, and I trust that no effort will be spared to make this the case.

You have just heard from the very excellent report read by our Secretary, that the Finances of the Society are also on a sound basis, and compare most favourably with any previous balance sheet of this Society. But if this highly favourable state of affairs is to continue, I would plead on behalf of our honorary and indefatigable Treasurer, that members would not let their subscriptions run into arrears of two or three years, as he

informs me is the case at present ; a very large amount of money being still outstanding. This is not only a source of great weakness to the Society, but inflicts unnecessary pain upon our Treasurer.

The attendance at our meetings has been considerably in advance of last year ; and I would take this opportunity of impressing upon members the necessity of recording their names in the Attendance Book, which is always upon the table near the door. Several of our members omitting to do so make our average attendance appear less than it really is. Even our summer gatherings, when many of us prefer to be in the field, have had a much larger average attendance than hitherto.

The Exhibits at our meetings have been unusually large and varied, embracing objects in most branches of Natural History. Many of these exhibits have been accompanied by short notes of great value scientifically—thereby enhancing the interest of the objects exhibited. One would be glad if more of our elder members could be prevailed upon to adopt this system ; it would not only add to the interest of the meeting, but be a source of encouragement and object of emulation to our younger members ; for the more we diffuse our knowledge, the more we are likely to popularize the Science of Natural History.

The Papers read at our meetings have been somewhat few and far between, although several excellent papers have been brought before us. The deficiency of longer papers would, I think, be well made up, and with very great advantage to the Society, if, as one of our earlier presidents, Mr. V. R. Perkins, in his valedictory address so pithily put it, we could get more short papers, not long ones. Our desiderata seem to be, records of observation on habits, life-histories, geographical distribution, variation—its causes and results—food-plants, short accounts of members' outings and captures, relation of insects to flowers ; in fact, any remarks relating to the charming study of Biology. Science was never intended to make us dull and prosy ; indeed, I am not at all sure that the narration of some of our adventures in the field does not tend to make our hobby more pleasing and popular.

The typical collections in our cabinet are still under the

care of our excellent Honorary Curator, Mr. West, who has spared neither time nor trouble in maintaining the specimens in fine condition and preservation, at which he is such an adept; the only failing appears to be that his desiderata do not arrive from friends in the abundance he could wish for, the vacant spaces in the drawers still being very numerous.

The Library, under the charge of our Honorary Librarian, Mr. Rice, continues to improve; and our special thanks are due to a few members who seem to think it not an act of charity, but a matter of duty, to add from time to time valuable works to our bookshelves.

Our heartiest thanks are due to my predecessor, Mr. Adkin, through whose generosity our Council has been enabled to place in the Library not only a very handsome, but roomy book-case at a greatly reduced cost; hence the regret of our Librarian on account of the empty shelves. There is here a fine opportunity for those of our members who wish to distinguish themselves, and gladden the heart of our Librarian, by donations from some of their valuable stores of surplus literature.

The Cabinet Club which was started in 1886, to enable members to become possessed of a cabinet by easy instalments, has with the exception of some slight unavoidable delay in delivery, been so far satisfactory; the whole number have been drawn, and, with two or three exceptions, delivered. I believe I am right in saying they have given much satisfaction. Many members who have recently joined the Society, with others who did not avail themselves of the first club, are now anxious that another on similar lines should be started. Our Secretary is at the present moment thinking the matter over, and will shortly bring it before you for consideration.

Many of our members will remember that in the month of January, 1888, Mr. Coryndon Matthews (now one of our members), wrote an article which was published in the *Entomologist*, the pith of which was, that a new entomological society should be formed, more especially for the use of country members, with headquarters in London. This was followed by a number of private letters upon the same subject, showing that there was a distinct desire among gentlemen in various

parts of the country for closer communication and intercourse with others more advanced in the study of Entomology. The Council at once considered the matter, and feeling that there was no necessity for the establishment of a separate society, whilst at the same time admitting that country students were labouring under great disadvantage, drafted a code of rules, offering especial facilities and advantages to country members studying any branch of Biology. These rules were almost upon the identical lines proposed by Mr. Matthews, and resulted in that gentleman almost immediately joining our ranks; and some 15 other students, including one lady, have been added to our list of members, several of them already claiming one of the advantages offered, namely, the identification of their specimens; one gentleman at Hastings having sent no less than three boxes of Coleoptera, amongst which were many local forms, as well as some great rarities. This, I think, is pretty conclusive evidence that our Council have not been men of idleness, but men of energy and action, knowing, when a want does arise, how to deal with it for the benefit of your Society.

During the past season the Council organized six Excursions, as compared with four in the previous season.

May 12th.—To the Zoological Society's Gardens, under the conductorship of Mr. Jenner Weir. It certainly would not be within the scope of this address to attempt to give an account of this rich collection, probably the finest in the world. Particular attention, however, was drawn to the large Night Heron aviary, constructed after the plan of that at Rotterdam. Already in this spacious volary two distinct species of Ibis had paired, and reared their hybrid young, making their rude nest on the top of a tree, and it might be expected in future that such interesting events would take place frequently. The new structures in which the Society's fine series of Wolves and Foxes, comprising sixteen species, are now exhibited, were also much admired. Altogether the visit was much enjoyed by all present, and by none apparently more than by Mr. Weir, whose visits to the Gardens from time to time have extended over considerably more than fifty years.

May 26th.—To Horsley, Surrey, under the able guidance of

Mr. J. A. Helps. This outing was not so satisfactory in point of attendance as could be wished, probably owing to the very stormy and inclement weather which had prevailed for several days previously. Nothing daunted, however, by the adverse condition of the atmosphere, some seven or eight gentlemen started off, and were well repaid for their trouble by a very enjoyable afternoon ramble among the woodlands of the locality. The Insect Fauna, no doubt owing to a prevailing N.E. wind, did not appear to be very abundant, but a few of the commoner species of Lepidoptera were taken, as also several good species of *Tenthredinidæ*. The deficiency of insects was, however, fully made up by an exuberant Flora, most of our members returning with many good botanical specimens. On our return journey to the railway station, the pleasures of the walk were enhanced by the music of the birds, the sweetest of all, the Nightingale (*Daulias luscina*), being very numerous; while the Cuckoo (*Cuculus canorus*) could be heard in several directions at the same time. As the shadows of evening were now gradually deepening, attention was called to the number of *Vespertilio* steering their rapid flight in quest of their evening meal, several distinct species being noticed. Although little was done, entomologically, all thoroughly enjoyed themselves, and voted the locality a very favourable one for future investigation.

June 23rd.—Weybridge, Surrey. This excursion was conducted by our very able guide, Mr. Carrington; and if not the most interesting of the series, was certainly the most numerously attended, no less than 24 gentlemen accompanying Mr. Carrington on this delightful outing. The temperature in the early part of the afternoon was almost tropical, tempered by a most refreshing breeze, but towards evening became very cold. On leaving Weybridge Common, our guide led us to the summit of St. George's Hills, where amidst a glorious wealth of magnificent trees we lingered to admire the beautiful views in the direction of Berkshire and Hampshire. Here we fain would have remained, but not so our guide, who hurried us on down the hills, amid the merry shouts of numerous picnic parties. The scenery as we descended was lovely, in every direction the view being rich with colour, and affording a picture that one might travel

hundreds of miles to excel. We ultimately arrived at the Hut Inn, at the foot of the Red Hill. Here there is a very fine piece of water known as Bolder Mere. Having strolled so far, and revelled in the beautiful views obtainable on all sides, we turned our steps to headquarters, the Hand and Spear, near Weybridge Common, where full justice was done to a substantial and refreshing meat tea, which was most acceptable to all of us. The remainder of the evening was occupied with pleasant conversation over the captures and botanical specimens collected during the ramble. It was specially noticeable that the Macro-lepidoptera and Hymenoptera were few and far between; but several fine series of Micros were taken, as also a few good Ichneumonidæ by sweeping.

July 14th.—Westerham, Kent. This outing was again under the guidance of our good friend, Mr. Carrington, and although not so well attended as the previous field meeting, was fairly well patronized, 15 or 16 gentlemen putting in an appearance. The party was conducted through some most picturesque and beautiful scenery, surrounded by objects zoological and entomological. The weather being all that could be wished for, insect life was very abundant, and from a Lepidopterist's point of view, very many good captures were made; while our Botanists did not return empty-handed; several choice floral specimens being met with. The outing was enjoyed by all, and the ground worked over pronounced most productive.

September 22nd.—Kew Gardens, Surrey. The attendance at this outing was somewhat disappointing as to numbers, but to those few members who did venture to attend, the afternoon was one of refreshing enjoyment. It was to have been conducted by myself; but on arrival at the rendezvous, my esteemed friend, Mr. Weir, who was the right man in the right place, immediately volunteered his services, and being a visitor of many years' standing was enabled to point out very many of the most notable botanical specimens, as well as to escort us to most of the houses of interest, such as the Palm House, Cactus House, the Victoria Regia House, the Fern Houses, both tropical and temperate, etc., etc. Altogether, a most enjoyable afternoon was spent amongst the beauties of

the botanical world, and I can only regret that more of our younger members did not avail themselves of the opportunity of gaining some valuable and useful information.

October 13th.—Fungus Outing. This was the First Annual Fungus Gathering of the Society, and was accordingly looked forward to with especial interest. Mr. Step with his usual kindness consented to conduct, and chose as his hunting ground the wooded portion of Esher Common, to the south of Claremont. It is somewhat unfortunate that the afternoons are so short during the period of year most suitable for such a gathering; but a considerable amount of work was accomplished by the party in the brief time at their disposal. It would be out of place here to give a list of the species obtained, though a few names may be mentioned. Perhaps the most noteworthy were the fine specimens of *Polyporus schweinitzii*, Fries, which attracted so much attention at our Annual Exhibition, several tufts of *Sparassis crispa*, Fr., were obtained, and a considerable quantity of the equally edible *Hydnum repandum*, L., and *Cantharellus cibarius*, Fr. Among other species collected were *Pleurotus salignus*, Abb. de Schwamm, *Lactarius torminosus*, Fr., *L. subdulcis*, Fr., *L. quietus*, Fr., *Russula ochroleuca*, Fr., *R. emetica*, Fr., *R. heterophylla*, Fr., *R. drimeia*, Clk., *R. nigricans*, Fr., *Tricholoma personatus*, Fr., *Clitocybe laccatus*, Scop., *Boletus subtomentosus*, L., *Amanita rubescens*, Pers., etc., etc. There was a fair attendance of members; but I think it highly probable (from the great amount of interest displayed in the Fungus Trophy at the Annual Exhibition) that a much larger number will take part in our second Fungus Gathering.

These field meetings will, I trust, in the future attract a very much larger number of those who rejoice in the leisure of a Saturday half-holiday, and who would take advantage of the immense field afforded by them for observation and research in the spacious world of Natural History.

The lines laid down for carrying out successfully your Annual Exhibition were on a much more extended scale than hitherto attempted, and it had probably never been excelled, even by the celebrated great National Entomological Exhibition of ten years since—Council and members working with a will and unanimity quite unprecedented.

But it would ill become me not to pay the tribute of honour to whom it is more especially due, I allude to your Exhibition Committee, viz., Messrs. Adkin, Barker, Briggs, Carrington, Step, and Yardley, to whose assiduous and indefatigable exertions I have no hesitation in saying you are indebted for the very great success obtained. Your Council on this occasion thought that, as the previous Exhibitions had been so very crowded, it would be as well to give a two days' Exhibition instead of one, as had been our previous custom, making a nominal charge (to cover expenses) for the first day's view, to enable students, who were anxious to examine the different objects of interest, to do so without encountering the unavoidable crush arising from the public view. Desirable as the idea seemed, it was only a partial success, for the great interest of the public was self-evident, from the rooms being crowded the whole time. Another innovation was also introduced with very good effect, showing that when help is necessary our members know how to do their duty. These exhibitions, as we all know, cannot possibly be held without a very considerable outlay, which our Honorary Treasurer very properly looks upon with a suspicious eye; and although there are amongst us many generous friends who have from time to time come to our assistance, it would not be wise to ride the free horse to death, so a Guarantee Fund was started, which was promptly and most nobly responded to by the members, considerably over £50 being promised if needed. But thanks to my friend Mr. Adkin's very capital idea (the private view at a nominal charge), the whole cost of the Exhibition was defrayed and a small balance left in hand without one shilling being asked for from the guarantors. It gives me very great pleasure, on behalf of my colleagues, to thank most heartily those kind friends who so admirably responded to the call for help, for while we have such members among us there need be no apprehension that the Society's Annual Exhibition will be a failure. Our very best thanks are not only due to our own members, but also to our very numerous friends of other and kindred societies, who held out the right hand of fellowship to us, by assisting with the loan of varied and valuable exhibits; to the South London Microscopical Society we are especially indebted, not only

for their very fine display of microscopes and microscopical objects, but also for their kind assistance rendered two or three times during the past season when they have exhibited at our ordinary meetings.

It would be most invidious on my part to attempt to particularize any exhibit where all were so good; and as I think I am right in saying that a list of the principal objects of interest will be issued with the "Abstract of Proceedings" I feel sure our members would prefer to see them in print, than to have them announced by me. But I should like to say a word with reference to the beautiful Cryptogamic trophy, which was arranged by Messrs. Step and Carrington. The general interest taken in this display will, I hope, induce some of our younger members to lend their assistance on a future occasion to help the executive in collecting. There is no lack of material, but only the workers are wanted to make such a show at our next Annual Exhibition as will not only astonish South London, but also the whole of London.

To Mr. Adkin we are indebted for the two delightful lectures given by Mr. May, illustrated with the Oxy-hydrogen light, on "The Wonders of Minute Vegetable and Animal Life," and "Curious Houses and Queer Tenants;" while to the Sciopticon Company our best thanks are also due for their interesting exhibit of Micro-Photographic Slides. Mr. G. Day also honoured us with an exhibition of the same kind of slides, representing entomological and geological subjects. It is needless to say that crowded audiences attended the whole of these entertainments. The Exhibition itself contained objects in nearly all branches of Natural History, many of the exhibits being sent from distant parts of the kingdom. Time will not permit me to say more than that the number of visitors who honoured us with their presence was very largely in excess of any previous gathering in the history of the Society. Among the visitors were many eminent Entomologists and Science workers in various branches. The great interest taken in the Exhibition was evinced by the fact that several days after we had closed ladies and gentlemen arrived who had travelled from places as far distant as Gloucester and South Wales, in hopes of

being enabled to view the different objects of interest collected together, no doubt attracted by the accounts given of our Exhibition in the daily papers. I think it will be a question for our Council to take into consideration whether it would not be advisable to keep future Exhibitions open for a longer term, say, three or four days. It is to be hoped that our Annual Exhibition has now become a permanent institution in the Society.

During the year 1888 our Insect Fauna has again been increased by many interesting species. I purpose calling your attention to a few, and, where possible, referring you to the published records in hope that those who wish to have full particulars of their capture, etc., may be benefited thereby.

Lepidoptera.

Retinia posticana, Zett., according to Mr. WARREN, the *Retinia* known to British Lepidopterists as *R. duplana*, and considered by Mr. BARRETT, to be a dwarf dark form of *R. turionella*, L., is identical with *R. posticana* (*Ent. Mo. Mag.*, xxv. p. 146).

Epischnia banksiella, Richardson, a Phycid new to science, two specimens, a ♂ and ♀, were taken at Portland, about the middle of July, 1887 (*Ent. Mo. Mag.*, xxv. p. 63).

Butalis laminella, H.-S. This species, which is new to Britain, was taken in Arundel Park by sweeping; two larvæ were subsequently found on *Helianthemum vulgare* in the same park (*Ent. Mo. Mag.*, xxv. p. 15).

Nepticula fulgens, Stainton, this pretty little species of *Nepticula* was bred by Mr. THRELFALL, from beech leaves and is new to science (*Ent. Mo. Mag.*, xxv. p. 12).

Nepticula serella, Stainton, another species new to science. A specimen bred July, 1860, from a larva found on Birnam Hill, near Dunkeld, September 11th, 1859, existed in the possession of Mr. STAINTON, without a name until the beginning of this year, when other specimens bred in 1887, by Mr. THRELFALL, from larvæ found feeding on *Potentilla tormentilla* on the Westmoreland Moors were submitted to Mr. STAINTON, who then described and named the species (*Ent. Mo. Mag.*, xxiv. p. 260).

These are all the lepidopterous novelties of the year, so far as we know; but many other interesting captures and observations

have been recorded during the past season, and reference will now be made to some of them.

Aporia cratagi, L., appears to exist still in some of its old British localities, as a specimen is recorded from the neighbourhood of Ramsgate (*Entom.*, xxi. p. 184).

Colias edusa, Fab., was observed at Eastbourne ; at Starcross, Devon, in the month of June ; at Haldon, Devonshire ; Lulworth Cove, Dorsetshire ; at Folkestone it was seen by our Secretary. It was also noticed at Chichester in September. The var. *helice* also occurred at the last named place (*Entom.*, xxi. pp. 184, 209, 272, 273).

Anosia plexippus, L., two specimens of this magnificent butterfly were seen flying along the beach at Worthing, one of which was captured (*Entom.*, xxi. p. 321).

Vanessa antiopa, L., has been seen or captured at several places in England, and the following have been recorded as taken : two in Essex, one sitting on the bole of a tree at Snaresbrook, in May, and the other at Whip's Cross, Walthamstow, in June ; four in Kent, one of our own members, Mr. FROHAWK, securing a fine specimen at Chatham, which he exhibited at the Society's Meeting, December 13th ; one at Folkestone ; one in the window of a chemist at Margate ; and the last on the high-road near Sevenoaks ; one at Battle, Sussex ; one in the New Forest, Hants ; and another was captured by one of our oldest members, Mr. S. STEVENS, at Totland Bay, Isle of Wight (*Entom.*, xxi. pp. 155, 184, 229, 254, 273).

Chærocampa celerio, L., was captured while hanging to the stone mullions of a window at Reading, Berkshire ; and *C. nerii*, L., was taken on a railway at Poplar (*Entom.*, xxi. pp. 232, 258).

Deilephila livornica, Esp. Two specimens were captured in June, at Penryn, Cornwall ; two at Belfast ; and one in Sussex (*Entom.*, xxi. pp. 186, 210).

Deilephila galii, Schiff, has appeared both in the perfect and larval stages ; in the latter, in some numbers, at various places in Britain, principally on the East Coast (*Ent. Mo. Mag.*, xxv. pp. 91, 111, 112 ; *Entom.*, xxi. pp. 210, 230, 231, 249, 256, 257, 273).

Acidalia immorata, L., has again been captured at the same locality as last year, near Lewes, Sussex (*Entom.*, xxi. p. 322).

Tortrix piceana, L. One of our rarest Tortrices has been recorded both from Hants and Surrey, and I think I cannot do better than to call the attention of members to a most interesting

note by Mr. SOUTH, in which he relates his first acquaintance with this lepidopterous rarity (*Entom.*, xxi. pp. 279, 319).

Hadena albifusa, Grote, was taken at sugar by Major PARTRIDGE, on the night of August 15th, in the Isle of Portland ; it is just possible that it escaped from some passing vessel from America ; while it is equally possible that it may have been reared on the spot (*Ent. Mo. Mag.*, xxv. p. 180).

Coleoptera.

In this order we have only one species to add to our British list ; but several of our rarer species have been met with.

Adrastus pusillus, Fabr., Candz : Mr. E. A. WATERHOUSE, one of our own members, has the honour of adding this interesting species to our list ; it was taken by sweeping grass near Sandwich, and although not before recorded as British, is apparently common all over the rest of Europe (*Ent. Mo. Mag.*, xxv. p. 133).

Quedius longicornis, Kr., one of our rarest Coleoptera, has been taken by another of our members, the Rev. W. W. FOWLER, who captured it under a tree trunk, in Bretby Wood, near Burton-on-Trent ; this being the second recorded capture in England—Mr. BLATCH having taken the same species in Buddon Wood, Leicestershire (*Ent. Mo. Mag.*, xxiv. p. 232).

Perileptus areolatus, Creutz, another of our rare and minute Geodephaga, has been taken on the banks of the Dee by Dr. ELLIS and Mr. R. WILDING (*Ent. Mo. Mag.*, xxv. p. 37).

Strangalia aurulenta, F., several specimens of this scarce and handsome longicorn were captured by our Vice-President, Mr. CARINGTON, in the neighbourhood of Great Berkhamstead, amongst the flowers of *Scabiosa arvensis* (*Entom.*, xxi. p. 213).

Harpalus cupreus, Steph., of the Geodephaga, *Leptusa testacea*, Bris., among Staphylinidæ, and *Cathormiocerus maritimus*, Rye, among the Rhynchophora, all of them scarce if not rarities, were exhibited at the Entomological Society's Meeting, on September 5th, 1888, by one of our very oldest members, Mr. CHAMPION, and captured by him at Sandown Bay, Isle of Wight (*Ent. Mo. Mag.*, xxv. pp. 117, 133).

Hymenoptera.

To our list of British species several notable additions have been made, as well as some of the rarer species being met with. In the

Ichneumonidæ *Pezomachus pilosus*, Capron, has been added to the list by Dr. CAPRON, who captured three specimens at Shiere, near Guildford, 1887 (*Ent. Mo. Mag.*, xxiv. p. 217).

Pimpla varicauda, Capron. To Mr. CAPRON again belongs the honour of capture of two females, at Shiere, of this species, which is new to science (*Ent. Mo. Mag.*, xxiv. p. 217).

Holomeristus tenuicinctus, Foerst, two ♀, and *Chorinæus tricarinatus*, Holmg., two specimens ♂ and ♀, both species from Shiere, have been added to the British list by Mr. CAPRON (*Ent. Mo. Mag.*, xxiv. p. 217).

Apanteles ferrugineus, Reinh, this rare little Ichneumon, had hitherto only been recorded as bred by Mr. PORRITT, from larvæ of *Chilo phragmitellus*; Mr. BRIDGMAN now records it as bred by Mr. W. H. B. FLETCHER, from the larvæ of *Macrogaster arundinis*, from Wicken Fen (*Ent. Mo. Mag.*, xxv. p. 67).

Tenthredinidæ; in this family Mr. CAMERON has succeeded in adding one species new to science, as also an addition to our list of British species.

Phyllotoma fumipennis, Cam., this new species was taken on Alder, by Mr. J. B. BRIDGMAN, at Norwich (*Ent. Mo. Mag.*, xxiv. p. 218).

Nematus crassicornis, Htg., this species has long been known to entomologists but never clearly recognised; Mr. CAMERON now identifies it and adds it to the British list, from specimens captured by Mr. BRIDGMAN, at Norwich (*Ent. Mo. Mag.*, xxiv. p. 218).

Mr. CAMERON also describes two species of new or little known British parasitic Cynipidæ, *Ægilips fumipennis*, Westwood, and *Phænoglyphis forticornis*, sp. nov. It seems somewhat of a pity that Mr. CAMERON does not say from what these species are bred; but as this gentleman is at present busily engaged upon his third vol. of British Phytophagous Hymenoptera (Ray Society), including the Cynips, we possibly shall not have to wait long for the information (*Ent. Mo. Mag.*, xxiv. p. 209).

Amongst the rarer species of Hymenoptera, Mr. E. SAUNDERS has been especially fortunate, particularly among the Heterogyna, and Fossores, capturing at Woking such good things as *Pompilus wesmali*, ♂, and *P. gibbus*, ♀, *Aporus unicolor*, ♂, a species of the greatest rarity, very few British examples being known, and Woking being a new locality, *Mimesa dahlbomi* and *equestris*, *Oxybelus mandibularis*, etc.; while Dr. CAPRON from the same locality has been

equally successful with the Diptera, taking *Sphcodes affinis*, and *pilifrons*, *Andrena decorata* (♀), and *analis*, *Epeolus variegatus*, *Nomada roberjeotiana* (♀), always one of our rarities, as well as the pretty little Dipteran *Anthrax fenestrata* (*Ent. Mo. Mag.*, xxv. p. 131).

MR. ENOCK, one of our own members, has also been very busy amongst the Parasites of the Hessian Fly (*Cecidomyia destructor*, Say.), having bred no less than ten distinct species from puparia, collected by himself in various barley fields, and has recorded the same in a most interesting note in the *Entomologist* (*Entom.*, xxi. p. 202).

Diptera.

Mr. R. H. MEADE, describes two species of Diptera new to science, *i.e.*, *Sarcophaga fulvicauda*, Meade, from two ♂ taken some years ago near Bicester, Oxfordshire, and a minute Cecid, *Diplosis fraxinella*, Meade, which appears to be an inquiline in the cauliflower ash gall, from which it was taken by Dr. CHAPMAN, in August, 1877. Mr. MEADE also adds to our British list *Theria muscaria*, Meigen. We are again indebted to the energy of one of our own members for the capture of this fine Muscid, Mr. CORYNDON MATTHEWS, taking a single ♀ at Ivy Bridge, South Devon, in 1887. Mr. VERRALL also speaks of the capture of the rare *Callicera anea*, Fab., a ♀, by the Rev. E. N. BLOOMFIELD, at Guestling, near Hastings, a specimen by the Rev. T. A. MARSHALL at Cornworthy, near Totnes, and another by a Coleopterist, the locality of which cannot be made out. This is the more to be regretted, as Mr. VERRALL states that in his experience of twenty-two years' collecting he never remembers but one specimen of this rarity being taken (*Ent. Mo. Mag.*, xxv. pp. 27, 77, 186).

Hemiptera.

Mr. E. SAUNDERS, has made two interesting additions to the British list in this order. The first, *Monanthia angustata*, H.-S., was taken by sweeping at Cisbury, Worthing; the second species *Amblystylus delicatus*, Perris, of which Mr. SAUNDERS got both sexes, was taken on *Gnaphalium germanicum*, at Woking. Both these species were exhibited at the Entomological Society's Meetings, June 6th, and September 5th, 1888, respectively (*Ent. Mo. Mag.*, xxv. pp. 34, 41, 78, 117).

Chlamydatus flaveolus, Reut., is another addition to our British species by Mr. JAMES EDWARDS, who has taken it at the roots of

grass and rushes, at Ranworth, Hellesdon, and Coxford, in Norfolk (*Ent. Mo. Mag.*, xxiv. p. 196).

Hemiptera-Homoptera

Liburnia punctulum, Kbm., has been determined as a good species, and added to our British list, by Mr. J. EDWARDS, as also *Liburnia reyi*, Fieb., which he captured in a marsh amongst rushes, at Weybourne, Norfolk. This gentleman has also identified four new species of the genus *Typhlocyba*. *Typhlocyba hippocastani*, Edwards, found by Mr. DOUGLAS, on the leaves of horse-chestnut (*Æsculus hippocastanum*), in Beaufort Gardens, Lewisham; *T. avellanæ*, Edwards, found by the same gentleman on hazel (*Corylus avellana*), also at Lewisham; *T. opaca*, Edw., from the same locality, and *T. bruni*, Edw., from the wild plum (*Prunus domestica*), Norwich (*Ent. Mo. Mag.*, xxiv. pp. 197, 198, xxv. pp. 157, 158).

Coccidæ.

Mr. DOUGLAS, with his usual critical observation among the bark lice, has succeeded in determining three or four species new to science, while he has added several others to the British list, *Aleurodes ribium*, Doug., he has found in his garden at Lewisham, attached to the underside of the leaves of the red and black currant. *Lecanium clypeatum*, Doug., he has obtained from *Adiantum capillus-veneris*, from a conservatory at Deptford, the same species he has received on another fern from Armagh; while Mr. CAMERON has sent him the mature form on *Bryophyllum calycinum* and *Asparagus plumosus*, from Sale, in Cheshire. *Pseudococcus ulicis*, Doug., this species has been determined from examples sent from Exeter, among the spines of Furze (*Ulex europæus*, L.), by Mr. E. PARFITT. The above three species are new to science; while an additional species has been added to the British list in *Lecanium bituberculatum*, Sign. Mr. PARFITT found this species on the twigs of Hawthorn (*Crataegus oxyacantha*), at Exeter, in February and March last; this being the first time it has been known to occur in Britain. It has since been found by Mr. Douglas on a hawthorn hedge at Lee (*Ent. Mo. Mag.* xxiv. p. 265, and xxv. pp. 58, 59, 88).

Arachnidæ.

Mr. ENOCK, one of our members, had the pleasure of exhibiting at the Entomological Society's Meeting, July 4th, both sexes of a spider not hitherto recorded on our British list. *Pellenes tripunctatus*, or *P. crucigerus*, a species of Salticidæ which was captured by Colonel LE GRICE, R.A., at Folkestone in May last.

The principal Ornithological event of the year seems to have been the remarkable re-appearance of Pallas' Sand Grouse (*Syrrhaptes paradoxus*), numbers of which have been met with and shot in most of the counties of the British Isles. It is perhaps too much to expect that sportsmen would refrain from shooting at anything that was at all new or rare; it is to be hoped that they have not taken too heavy a tithe of these distinguished Asiatic visitors, but have left at least some pairs for the nesting season in the hope that they may breed in this country, which there is every likelihood of their doing in certain localities if unmolested. I cannot do better than refer members who would like to know more of this interesting visitor to the *Zoologist*, vol. xxiii., Nos. 138, 139, 140, 141.

The various and valuable contributions to Entomological and Biological Literature generally, have been very considerable during the past year. But time does not permit us to notice more than a few of the most interesting publications, among which are the following:—

“Observations on Ants, Bees, and Wasps,” Part II. By Sir John Lubbock, Bart., M.P., D.C.L., LL.D., F.R.S., etc., contains some most interesting and valuable information. Printed for the Linnean Society, London.

“A Manual of Zoology for the use of Students, with a General Introduction on the Principles of Zoology.” By H. A. Nicholson, M.D., Professor of Natural History in the University of Aberdeen. Seventh edition. Blackwood and Sons, London.

“British Oribatidæ.” By Albert D. Michael, F.L.S., F.Z.S., F.R.M.S., etc., Vol. II., Ray Society, 1888. This is the second and concluding volume of Mr. Michael's Monograph of the British Oribatidæ, and was issued by the Ray Society to its subscribers for the year 1887. This work is illustrated with most valuable plates, and the letterpress bears evidence of the painstaking and scientific accuracy of the author, and cannot fail to be invaluable to Acarologists as a text book, as well as a work of great interest to naturalists generally.

“An Illustrated Manual of British Birds.” By Howard Saunders, F.L.S., F.Z.S. To be completed in about twenty

parts. Parts I–IV., 8vo. London: Gurney and Jackson, 1888. To the Student of Ornithology, this Manual promises to give great satisfaction, and to be a work much wanted, namely, a volume complete in itself; while the cheapness of the publication (one shilling a part) will bring it within the reach of all.

“On the Senses, Instincts, and Intelligence of Animals, with especial reference to Insects.” By Sir John Lubbock, Bart. M.P. With 100 Illustrations. This work may be regarded as a sister volume to the *Ants, Bees, and Wasps* of the International Scientific Series, but its scope is much wider; and in consequence, its subject matter is likely to be of much more interest to the general public; it is certainly one of the most instructive and entertaining of the works which have been produced by Sir John Lubbock.

“Bird’s-nesting and Bird-skinning: a complete description of the nests and eggs of birds which breed in Britain.” By Edward Newman. Second Edition, revised and rewritten; with directions for their Collection and Preservation; and a chapter on Bird-skinning by Miller Christie, Fcap. 8vo., pp. 138. London: T. Fisher Unwin, 1888. Appears to be a most useful work to Oologists, full of valuable information in a condensed form, many good species having been detected and reported, as well as some interesting facts concerning the nidification of many of the rarer birds.

“Entomology for Beginners; for the use of young folks, fruit growers, farmers, and gardeners.” By A. L. Packard, M.D., Ph.D. New York: Henry Holt & Co., 1888. 354 pp., 8vo., 373 woodcuts. This book may be highly commended to English Entomologists as a multum in parvo of information, and is probably the best and most exhaustive work of its kind ever printed in the English language.

“A List of British Diptera.” By G. H. Verrall, F.E.S. 31 pp., small 4to. London: Pratt & Co., 1888. This is a most welcome little volume, and emanating as it does from one of our own members will be deemed of especial value to those of us who take an interest in the order Diptera.

I now have to turn to the sad side of my address; I mean the Obituary. Happily death has claimed none of our own

members; but he has been very busy outside our ranks amongst naturalists of great note and high position. Amongst many others:—

GEORGE ROBERT WATERHOUSE, a past President of the Entomological Society, died January 21st, 1888, in his seventy-eighth year. By his decease the Entomological Society of London has to deplore the loss of one of its fathers. In 1833, when the Society was founded, Mr. Waterhouse was appointed its first Curator. In 1835 he accepted the Curatorship of the Royal Institute's Museum, at Liverpool, which he again exchanged in little less than twelve months for the Curatorship of the Zoological Society of London. In 1843, he was appointed an assistant in the Geological Department of the British Museum; and in 1844 commenced his work on the "Natural History of Mammalia," which occupied all his available time until the completion of the second volume in 1848, when, owing principally to the outbreak of the French Revolution, the publisher was unable to continue the work. In the year 1849 and 1850, he was President of the Entomological Society, and in the latter year he was elected Honorary Fellow of the Zoological Society. He was the author of many articles in various scientific journals, and was an excellent draughtsman, many of his papers being illustrated by himself. Latterly he occupied himself with literary research, and in his official capacity was much engaged in the preparations for the removal to South Kensington of the Geological Collections, which since 1875 had been separated from the minerals. By his advice, which his early training as an architect qualified him to give, the plans for the basement and ground floors of the right wing of the New Museum were considerably modified, so as to increase the accommodation for the collections. This work harassed him very much, and feeling unequal to the anxiety therein entailed he resigned his appointment in 1880.

DR. JOHN THOMAS BOSWELL, F.L.S. (formerly known as Dr. Boswell Syme), was born at Edinburgh, and educated as a Civil Engineer, which profession he followed for some time. But his name will always be associated with the second edition of Sowerby's English Botany, which he brought to a successful conclusion. For a time he was Botanical Lecturer,

both at Charing Cross and Middlesex Hospitals; and although a practical botanist, he also took great interest in Entomology, and formed a fine collection of British Lepidoptera. He was especially fortunate with the larger Sphingidæ, particularly *Deilephila galii*, and wrote some interesting notes on the larvæ of the same in the *Ent. Mo. Mag.*, vol. ii. p. 5. His death took place at Balmuto, Fifeshire (where his family is said to have existed continuously since the 14th century) on January 31st, aged 66.

JAMES ENGLISH, was born at Epping, Essex, where he received but a very elementary education. After leaving school he was engaged at the shop of the celebrated Henry Doubleday, in Epping, where he soon acquired a taste for the pursuits of his master; and it is principally in this connection that he will be remembered by members of this and kindred societies, for so long as Mr. Doubleday was enabled to continue his favourite study did Mr. English remain with him as his collector. Whenever opportunity occurred the Fen country was one of their happy hunting grounds, and English was one of the last to take the two rare Lepidoptera for which the district was noted, viz., *Polyommatus dispar* and *Noctua subrosea*, both now apparently extinct in these Isles. For upwards of fifty years he had been a collector of biological objects; but during the latter years of his life he devoted much attention to the Cryptogams, and discovered a method of preserving them. He seldom contributed anything to entomological literature, but has written two small works upon the preservation of Fungi and Plants. He died on January 12th, 1888, at the age of 67 years, after an illness of six months, said to have been brought on through excessive exertion in pursuit of his favourite studies.

JAMES HAMER died on the 14th of November, 1887, aged 46 years, and was interred at Southport. He was well known in the North of England as a hard-working entomologist, but more as a practical collector than as a writer.

JOHN SMITH, of Kew Gardens fame, died in March, 1888, at the ripe age of 92 years. He was one of our best botanists, and made an especial study of Ferns, upon which he has

written several works. He retired from active work at the Gardens twenty years since, but not until he had largely helped to make Kew the celebrated place it is.

HENRY JAMES STOVIN PRYER, C.M.Z.S., whose death I regret having to record, was born in London, June 10th, 1850. His taste for Natural History developed at a very early age; and before he was eighteen he had formed a considerable collection of British Lepidoptera, as well as Trichoptera, chiefly from the neighbourhood of London. Among the former he took *Sterrha sacraria* close to London, and *Eupithecia togata* in Essex, *Trachonetis pryerella* being named in his honour. He left England for China in 1871; but his stay there was of short duration, he being offered a position in Japan, where he made his home. He never revisited Europe, but was in hope of doing so this or next year. Mr. Pryer was engaged in mercantile pursuits; and at the time of his death was in partnership with another well-known naturalist, Mr. James Bisset, F.L.S. As soon as he settled down in Japan he systematically studied the Fauna of the surrounding islands. He visited Borneo in 1884; and in June, 1886, accompanied by a Japanese collector, he made a tour of the Loo-Choo Islands. As little was known of the Fauna of this interesting group, a very large proportion of the species of insects discovered were new to science. The birds have been described by Mr. Seeböhm; but the Lepidoptera are yet only partially described. He was a Fellow of the Entomological Society of London, and occasionally contributed papers, notably one on the mimicry of insects of different orders. Quite recently he projected a monograph of the Japanese butterflies, under the title of "*Rhopalocera Niponica*," a work unique of its kind, executed entirely in Japan, with the text in the vernacular and in English. One part has appeared; and the second of the three parts proposed was in the press at the time of his decease. He was elected a Corresponding Member of the Zoological Society in 1878, for his many valuable contributions of living animals to the Gardens. He was attacked by bronchial pneumonia, and died unexpectedly on the 17th February at his residence, 127, Bluff, Yokohama, Japan, at

the early age of thirty-seven years, after a residence of seventeen years in that country.

MISS M. E. GLANVILLE, the very able and kind-hearted Lady Curator of the Albany Museum, Graham's Town, South Africa, died on April 4th. She will long be remembered by entomologists for her hearty devotion and painstaking assiduity in the study of Economic Entomology. On the death of her father, who might be termed the founder of the Albany Museum at Graham's Town, Miss Glanville, who was an ardent student of Natural History, was appointed to take his place, to the great delight of those connected with Biology in the district. For years past her especial attention has been scientifically devoted to the life histories of insects injurious to the crops of East Province, S. Africa, many specimens of which, with their histories, have been forwarded to this country to her friend Miss E. A. Ormerod.

PHILIP HENRY GOSSE, F.R.S., whose name was a "household word," among naturalists, was born at Worcester in 1810, and early developed a taste for Natural History. Being engaged in mercantile pursuits, he visited Newfoundland on business in 1827, residing there eight years, during which time he found leisure to study the insects of that country and of Lower Canada, making a valuable and large collection. He finally settled down at Torquay, where he devoted himself almost entirely to Marine Zoology, the results of his studies appearing from time to time in such works as "The Aquarium," "A Manual of Marine Zoology," "Tenby, a Seaside Holiday," "The Romance of Natural History," "A Year at the Shore," "Evenings at the Microscope," and very many others; but doubtless his most important work was his "Actinologia Britannica," a history of the British Sea Anemones and Corals, which was finished in 1860. His latest work was "The Rotifera or Wheel Animalcules," which he undertook in conjunction with Mr. Hudson, and completed in two large quarto volumes in 1886. His health, gradually failing, compelled him to rest from work; and on the 23rd of September he passed peacefully away, at St. Mary Church, Torquay, at the age

of seventy-eight years. He was elected a Fellow of the Royal Society in 1856. As an excellent outdoor naturalist, Mr. Gosse was well nigh unsurpassed; and no doubt, to his teachings many are indebted for their love of Natural History.

JOHN SCOTT, was born at Morpeth, September 21st, 1823, and died August 30th, 1888, in his 65th year. He appears to have acquired a taste for Natural History at an early period. He first came into notice as an Entomologist, by a note to the Zoologist in 1849, on the curious habitat of *Tinea ustella*. His studies appear to have been principally confined to Lepidoptera, until the year 1862, when we find him sending a paper to the Entomologist's Annual, giving a description, with a figure of one of our rarest species of Hemiptera (*Metatropis rufescens*, H.-S.). He also amassed a goodly collection of British Coleoptera; but the order of Hemiptera was his especial forte, to which he devoted most of his spare time and attention. He was the joint author with Mr. Douglas, of the well-known work upon British Hemiptera, published by the Ray Society in 1865, his share being the description of the Capsina. He was an indefatigable collector and genial companion, until afflicted with a complication of diseases, which terminated his existence.

THOMAS EEDLE, was born at Pinner, Middlesex, in 1829, and died December 31st, 1888. He was well known to Entomologists, more especially in the East of London; not only as a dealer in insects, but as a practical collector, he being the discoverer of several species of Lepidoptera; and although he contributed little to entomological literature, he will long be remembered as a diligent worker, and always ready to assist. The Members of our own Society will remember how willingly he responded to our appeal for help at our Annual Exhibition of 1887, by the loan of many valuable objects of interest.

I fear, Gentlemen, that I have taxed your patience somewhat severely; but before closing this address there are one or two points with reference to the affairs of the Society on which I must say a few words. In the first place, I must express my deep regret, which I am sure you all share, that we have lost

(at any rate, for the time being), the valuable services of our excellent friend Mr. W. A. Pearce, who has been compelled by business to leave us for the New World, he having accepted an appointment at Chicago. I can only wish him every success, and that our loss may be his gain, and that we shall soon be enabled to find another of our members, not only able, but as willing to use his pencil as brilliantly for the benefit of the Society as our friend has so frequently done.

I have already said, and hope I have made it clear, that I desire to appeal to a much larger and wider circle, and to bring into this Society all who can in any sense be called naturalists, or induced to take any part in the study of Natural History. Each individual has his place in nature and a share of work to do, and each of us requires the aid of others. There is room for all students, no matter how humble their efforts or of what branch they may be votaries, neither should sex be any barrier.

I remember reading some years since of a mean selfish fellow who was said to have destroyed duplicate specimens, that he might boast of his uniques, as if there was any great credit due to a man for being the first to capture a specimen, which others might have done equally well, had they been there at the same time and place. I feel sure that this is not the spirit we intend to cultivate. The charms of Natural History are boundless; and aspirants, particularly our younger members, ambitious for scientific honour, need not fear that there will be no opportunity for them to distinguish themselves by the discovery of new species, as I have already shown you by the list of captures during the past season. It may be difficult to estimate the advantages such a Society as ours confers; but I am quite convinced that many of our members have enjoyed the means of gaining and imparting knowledge in one of the most interesting departments of research. But apart from the scientific gain, I am also fully aware of the social profit of our gatherings, and the opportunities they afford of forming friendships of a firm and lasting character. We have now entered upon a New Year with vigour and healthy activity. There is plenty of work for the Society to do; then let us go forward with the full determination to do it, remembering, while we ourselves are benefiting, to com-

mend to our friends the advantages of membership, so that the numbers and the prosperity of the South London Entomological and Natural History Society may still continue to increase as time passes along.

In conclusion, Gentlemen, I can only thank you sincerely for your kindly and considerate courtesy in overlooking my many faults of omission and commission, during my term of office. I accept the position to which you have been pleased to re-elect me, with deep feelings of gratitude and regret; regret, that my abilities and qualifications for the office fall so far short of my desires; gratitude, for your kind recognition of my humble efforts to further the interests of this Society.

T. R. BILLUPS.

ABSTRACT OF PROCEEDINGS.

JANUARY 12th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. F. W. Hawes, C. E. Runnacles, and A. E. D. Gould were elected members.

Mr. J. Jenner Weir exhibited specimens of *Cicadetta montana*, Scop., and stated that it was the only species of Cicadidæ that was found in Britain. It was not common, and was almost confined to the New Forest, two or three being taken yearly; this year the Gullivers among them had taken a dozen examples, all, with one exception, being females. The capture of so many females, Mr. Weir thought, might be explained by the males being more active than the females, and thus being able to elude capture.

Mr. Tugwell exhibited specimens of *Dianthæcia cæsia*, Bork., from Germany, and the var. *manani*, Gregson, from the Isle of Man, for the purpose of comparison, and pointed out that the Manx insect was dark slaty blue in colour, whilst the German examples were pale bluish grey with a pale ochreous grey central fascia; further, the Continental specimens were decidedly larger than the English examples, and altogether appeared hardly referable to the same species. Also Continental examples of reputed and rare species of British Lepidoptera, among which were *Cloantha polyodon*, Clerck., *Acontia solaris* v. *albicollis*, Fb., *Thalpochares parva*, Hb., *Eulepia grammica*, L., *Notodonta trilophus*, Fb., *Bryophila algæ*, Fb., and *Lythria purpuraria*, L. With reference to the last-named, Mr. Tugwell said that it had no right to appear in the British list, as there was not a single authentic record of its capture in Britain. Mr. Carrington said that he knew of two authentic examples of this species, one of which he saw alive, and both were taken about seven miles from York, there being an interval of eight or ten years between the times of

capture of the two specimens; the first one referred to was now in Mr. Allis' collection at York. Although he, in common with Mr. Prest, and many other Yorkshire lepidopterists, had worked the same district for many years, he did not know of any further specimens having been seen.

Mr. Dobson exhibited specimens of *Agriopsis aprilina*, L., and a short discussion ensued as to the reason of the green colour in this species fading so quickly when compared with the green colour of *Moma orion*, Esp., and *Geometra papilionaria*, L.

Mr. G. Skinner exhibited a specimen of the Black Rat (*Mus rattus*, L.), which he stated was one of four recently taken at Price's Candle Factory, Battersea. With reference to this now very rare species of rat, Mr. Carrington contributed observations, and Mr. T. W. Hall stated he had seen one alive in Cannon Street at the end of last year.

Mr. Tutt contributed remarks on the reputed captures of *Acidalia strigaria*, Hb., in Kent, and suggested that they might have been small specimens of *A. remutaria*, Hb., as two years since, at Chattenden, he had taken about forty, of what he in the dusk thought were *A. subsericeata*, Haw., but which on examination proved to be small specimens of *A. remutaria*, the curious fact being that there was not one full-sized specimen among the forty captured.

JANUARY 26th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Tugwell exhibited Welsh and German specimens of *Xylina furcifera*, Hufn., and referred to the difference between the latter and the British representative of the species. The Llantrissant insect was, he said, much darker in colour, being a deep violet, inclining to blackish, whilst the European specimens were a dull violet grey, with a warm reddish tone in the stigmata, particularly in the reniform. The tone of coloration is the principal difference between the two forms, the European being, as a whole, a paler and duller insect.

Mr. Tutt exhibited, on behalf of Mr. Alderson of Farnboro', Kent, the following varieties:—

Aplecta tincta, Brahm., with the ordinary markings of a deep purple colour. *Phigalia pedaria*, Fb., with the basal half

of the anterior wings very black, the remainder of the anterior wings and the inferior wings darker than usual. *Spilosoma mendica*, Clerck., with only one black spot on each wing. *Scopelosoma satellitia*, L., of a greyish ground, marbled with black. *Anaitis plagiata*, L., with the transverse lines contracted into a single band. *Teniocampa munda* var. *immaculata*, Stgr., and one of a grey ground colour.

Mr. T. R. Billups exhibited on behalf of Mr. W. F. de V. Kane, specimens of *Rhopalomesites tardii*, Curt., from Killarney and Powerscourt, Ireland, and invited remarks upon the same as regards variety; but the opinion seemed to be that there were no varieties, the pale forms being only immature specimens.

Mr. H. T. Dobson read a paper, "Does the Darwinian Theory lessen Biological Mystery."

FEBRUARY 9th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. F. Warne, N. Warne, A. T. Mitchell, F. E. Strong and P. C. C. Billups, M.D. were elected members.

Mr. R. South exhibited long series of *Cerastis vaccinii*, L., and the dark insect known in this country as *C. spadicea*, Hübn. This last, he said, was most certainly the insect known on the Continent as *Cerastis*, or rather *Orrhodia ligula*, Esp., var. *polita*, Hübn., specimens of which he also exhibited, as well as examples of Hübner's *spadicea* and *mixta*, Staud., both of which are forms of *C. vaccinii*, as known to Entomologists in this country.

Mr. South went on to say that, although he could not conclusively prove it, yet he was strongly inclined to think that *C. vaccinii* and *C. ligula* were forms of one species, and he illustrated by examples that certain characters, other than the dark coloration of primaries, claimed for *C. ligula* only were also to be found in *C. vaccinii*.

Mr. J. W. Tutt exhibited *Xylophasia rurea*, Fb. (vars.), including a whitish grey form having a slight glaucous tinge, rare in Britain; the specimens shown coming from Sligo, although it was occasionally taken in the Isle of Man, and at Rannoch. The other varieties included a banded form from

Lewis, ochreous forms, and the dark varieties leading up to an intensely reddish black form, var. *alopecurus*, Esp., from Rannoch.

Mr. F. W. Hawes exhibited the following varieties :—

Epinephele ianira, L. (♂), having the left forewing entirely bleached. Taken July 29th, 1885, in Perry Wood Enclosure, New Forest. *Argynnis paphia*, L. (♂), with spots and bars on upper surface confluent, colour of under surface blended and confused. Taken July 23rd, 1885, Park Hill Enclosure, New Forest. *Lycæna argiolus*, L., in which the blue of upper surface was exceedingly rich, and very similar in tint to the blue of *bellargus*, Rott. Taken on the cliffs near St. Peter's Port, Guernsey, June 14th, 1887.

Mr. J. Jäger exhibited an aberration of *Vanessa antiopa*, L., the yellow margin of the superior wings being broader than usual and obliterating the blue spots, the specimen was bred in Germany by Mr. William Werner, who had also bred another example, in which the usual blue spots of inferior wings were obliterated.

Mr. R. South, on behalf of Mr. T. H. Leech, exhibited specimens of Coleoptera, mounted on triangular pieces of microscopic glass, enabling the under surface of the specimens to be studied.

Mr. T. R. Billups exhibited, on behalf of the Rev. W. F. Johnson, examples of *Bembidium clarkii*, Daw., taken by sweeping and in moss on the shores of Lowry's Lough, and in the Mullinures, Armagh.

FEBRUARY 23rd, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

The Secretary read a paper by the Rev. W. F. Johnson, "Notes on the Geodephaga in Ireland."

An Exhibition of microscopic objects then took place, the Society being assisted by Messrs. E. Dadswell, J. Terry, R. Macer, and Coombs, members of the South London Microscopical and Natural History Society. Mr. Eland Shaw exhibited photogenic apparatus of *Lampyris noctiluca* (transverse section), leg and foot of *Ophion*; Mr. Dadswell, *Spongilla fluviatilis*—a beautiful object; Mr. Terry, stem of

sweet-brier, and *Vorticella*; Mr. Macer, *Orthesia insignia*, and head and eyes of the jumping spider; Mr. Turner, under side of *Argynnis aglaia*; Mr. R. Adkin, fresh-water algæ in conjugation, *Volvox globator* with resting spores, section of stem of Virginian creeper, head of *Vespa rufa*, also *Alaptus minimus*, one of the smallest hymenoptera in the world; Mr. Coombs, section of eye of blow-fly; Mr. West, sun animalcule (*Actinospherium*), and water-flea; Mr. Medland, diatoms; and Mr. Tutt, wings of lepidopterous insects.

MARCH 8th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. H. Robson and H. A. Auld were elected members.

Mr. R. Adkin exhibited a variety of *Eubolia bipunctaria*, Schiff., in which the whole of the ground of the forewings was black; a whitish grey basal patch and central fascia (the latter enclosing the usual central spots, which were very prominent), being the only markings visible; hindwings correspondingly dark. The specimen, which is a male, was taken by Mr. O. Dannenberg at Boxhill, in July, 1886. Plate I., fig. 9.

The following notes from Mr. T. D. A. Cockerell were read:—

Agrotis suffusa. This insect is abundant in America, from Georgia and Texas to Hudson's Bay, and is now generally known there as *A. ypsilon*. It appears that Von Rottemburg described it in 1776 under the name *ypsilon*, which is prior to Hübner's *suffusa*, and ought therefore to take its place, and I would suggest that unless any sufficient reason can be given, the prior name should be adopted in England. An additional synonym to those given in the "Entomologist" Synonymic List, is *A. telifera*; Harris, 1841.

On the origin of *Gonepteryx cleopatra*, L. At a meeting held early in 1887, I expressed the opinion that the change of colour from red to yellow seen in certain species of *Zygæna*, and allied moths, as well as in other classes of animals, was due to the effect of ill-conditions in breaking up or altering some rather highly complex pigment. Mr. South remarked at the time that the case of *Gonepteryx cleopatra* was probably a case of the formation of that pigment from a simpler one, a

view from which I was inclined to dissent at the time, on the ground that the orange and red pigments were not identical. I could not then explain the orange patch in *G. cleopatra*, on other grounds, however, and was obliged to let the matter rest. I am now convinced that *G. cleopatra* arose as a seasonal variation, thereby differing from the aberrations of *Zygæna* and its allies, which certainly do not arise in that way.

An American species of *Colias*, the *C. eurytheme* of Boisduval, which is generally distributed throughout the States, has on the forewings an orange patch on a yellow ground, precisely similar to that of *G. cleopatra*. There is, however, a seasonal form *keerwaydin*, Edwards., which emerges from pupæ which have hybernated, and has the orange patch much reduced, in some specimens being almost or entirely suppressed. Now the seasons in America are very marked, the difference being much greater than in Europe, hence the summer and winter types must necessarily alternate; but supposing that the climate of America was to become much more uniform, the northern States uniformly cold, the southern ones uniformly warm, what would happen? Is it not obvious that the winter form of *Colias eurytheme*, with a much reduced orange patch, would be perpetuated in the north, while the summer form would be prevalent in the south—thus producing species (for so they would then be called) exactly analogous to *Gonepteryx cleopatra* and *rhamni*? Many things point to the fact that the seasons were once extremely marked in Europe; and I have no hesitation in saying that in those old days *Gonepteryx rhamni* and *cleopatra* were but seasonal forms of one and the same species.

Mr. John T. Carrington read a paper "British Salmonidæ and their Culture."

MARCH 22nd, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. E. Knight, C. J. Montague, J. E. Lloyd, W. Roots, and R. Pierpoint were elected members.

Mr. R. South exhibited specimens of *Polyommatus phlæas*, L., with ocellus on under surface of left posterior wing, similar in character to the marginal ocelli on the under surface of

anterior wings, and an example of *Papilio biano*, Cram., with a patch of the colour and ornamentation proper to the under surface of hind wings on the under surface of right forewing. The abnormalities had the appearance of insects which had been patched up or mended, but with the exception of the unusual markings referred to, they were quite perfect specimens. The *Polyommatus* was captured by the exhibitor in N. Devon, 1881, and the *Papilio* by Mr. Leech's collector in China, 1887.

Mr. T. R. Billups exhibited a case illustrative of the life history of *Abraxas grossulariata*, L. This, Mr. Billups said, was prepared by Mr. Mosley, and formed one of a series arranged for educational purposes.

Mr. W. White exhibited preserved larvæ of certain species of the genus *Acronycta*, and remarked that the object of his exhibit was to illustrate the differentiation of character in the larvæ of this genus, as with some of the moths there was the strongest similarity; whilst in the well known instance of *A. tridens*, and *A. psi*, it was so close that Entomologists were unable to discriminate between them. He was desirous of obtaining ova of any of the genus, as he thought it would be extremely interesting to study the affinity of the group very closely. It was well-known that the larvæ of many of the species varied greatly in different stages; and it was probably by the study of the earlier forms of the larvæ, that correct and natural views of the relationship of the group would be obtained.

Mr. South said that he had been informed that in their earlier stages the larvæ of *A. psi* could not be separated from the larvæ of *A. tridens*.

Mr. J. Jenner Weir exhibited British and French specimens of *Euchlœ cardamines*, L., and read the following note:—

"I have observed for some years that there is a difference between the Continental specimens of *Euchloe cardamines*, so far as I have been able to examine them, and those captured by myself in Kent, Surrey, Sussex, and Hampshire. I have a series of twenty-four males of this insect captured in the above counties: these have the orange spot on the upper wings reaching but slightly beyond the discoidal black spot. The inner edge curves outward, not extending beyond the first median nervure, thus leaving the hinder angle white. This

disposition of marking I find perfectly constant in those I have captured.

"In the Continental specimen I find the orange spot extends considerably beyond the discoidal spot, and is continued to the inner edge of the wing, causing the hinder angle of the wing to be orange. Lang, in his "*Rhopalocera Europæ*," figures this species with the hinder angle orange, as though the drawing had been taken from a Continental specimen; but the orange of the wing extends only in relation to the discoidal spot, to the extent usually seen in British specimens. Newman, in his *British Butterflies*, figures the species with the shading in lieu of colour extending to the inner edge of the wing, as usual in Continental but not British specimens.

"The distinction pointed out is very small, but if it be constant our *Euchloe cardamines* is an insular variety easily separable from continental specimens of the species."

Mr. Frohawk presented a water-colour drawing by himself of the egg of the Great Auk (*Alca impennis*, L.).

Mr. B. W. Adkin exhibited a mounted specimen of the Robin (*Erithacus rubecula*, L.), having the feathers of the head of a white colour. The specimen was found dead in a garden at Lewisham, 1878. Mr. Adkin said that two years afterwards he observed a specimen at Reigate with the same peculiarity, and he asked whether any Member could give him information as to whether it was due to variation or caused by age. Mr. Frohawk remarked that from an examination of the feet of the bird exhibited, he was of opinion that it was not an old one, but undoubtedly a variety. Mr. J. Jenner Weir also expressed an opinion that the white plumage of the head was due to variation.

Mr. J. W. Tutt read a paper, "The Morphology and Physiology of an Insect."

APRIL 12th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. F. G. Fenn, on behalf of Mr. T. D. A. Cockerell, exhibited a new rose-gall, *Rhodites tuberculator*, Riley MS. n. sp., and the following note by Mr. Cockerell was read:—

"Every British Entomologist must be familiar with the red

hairy galls so frequently seen on the native roses, the product of *Cynips rosæ*; and in this district (Custer County, Colorado), a no less familiar object is a spherical but not hairy gall, abounding on the prickly branches of the wild rose. The specimens now exhibited were obtained at Swift Creek, on February 26th, and some on being cut open were found to contain living larvæ. A few specimens being sent to the U.S. Department of Agriculture at Washington, were pronounced by Mr. L. O. Howard to be the product of an undescribed species, *Rhodites tuberculator*, Riley MS., which, however, was contained in the collection of the Department. In an old gall I was fortunate enough to find a dead specimen of the imago. It is about three millimetres long, almost black, and shiny. The legs are reddish, and the wings tinged with brown. I await the breeding of living examples to draw up a detailed description, this example being too mutilated for the purpose."

Mr. Slater exhibited an example of a *Bombyx* from Zulu Land, which he said approached nearest to *Bombyx oubie*, taken by M. Guerin, in South Abyssinia, and might be a local variety of that insect; if not, it was a new species.

Mr. C. H. Watson exhibited varieties of *Hybernia leucophearia*, Schiff., from Richmond Park.

Mr. R. Adkin remarked on the small size of the specimens, and suggested that if this was the average size of the examples taken this year it was no doubt attributable to the hot dry summer of 1887. Mr. Watson said that they were a fair average of those he had taken, and other Members remarked that they had this spring seen many undersized examples.

Mr. Tugwell exhibited two forms (grey and black) of both sexes of *Nyssia hispidaria*, Fb., which he stated were bred from one batch of ova from Richmond Park. In replying to Mr. White he said that the larvæ did not vary to any extent, whereas in rearing the variety *fuscata* of *Hybernia marginaria*, Bork., he had found that the black variety of the larvæ to a large extent produced dark varieties of the perfect insect.

Mr. Jenner Weir exhibited specimens of *Pieris brassicæ*, L., from St. Petersburg, lat. 60°, Lewes and Blackheath, between lat. 50° and 52°; Hyeres, lat. 43°; showing that the species

did not differ from places so remote, either in marking or in size.

Mr. Henderson, with a view to illustrating the local variation of different species of lepidoptera, exhibited *Satyrus semele*, L., *Cucullia verbasci*, L., etc., from various localities. Mr. Tutt, with reference to the last-named, said, those exhibited showed a good deal of variation, and he thought it was probable that varieties of *C. verbasci* were frequently offered as *C. scrophulariæ*, Esp., a species which did not seem to be found in Britain at the present time. Mr. Tugwell expressed an opinion that in many cases the supposed *C. scrophulariæ* were simply assumed to be that species because the larvæ were found feeding on the *Scrophularia* instead of on *Verbascum*, the usual food-plant of *C. verbasci*. Mr. Carrington said it was now a well-known fact that the larvæ of *C. verbasci* fed on both the plants named by Mr. Tugwell.

Mr. T. R. Billups exhibited a specimen of the genus *Aspidimorpha* from Upper Burmah, belonging to the group *Phytophaga* (Plant-eating Beetles), and read the following note:—

“This beautiful specimen was brought from Upper Burmah, amongst the roots of an Orchid (*Dendrobium brymerianum*), and belongs to the family Cassididæ (or Tortoise Beetles), a very extensive family of Beetles, with highly developed elytra. In this country we have but one genus of Cassidæ, numbering some thirteen species, while the exotic species are very numerous; our own species are not very remarkable for their beauty, being mostly a dull pale green, which renders them almost invisible while clinging to their food-plants. We certainly have one or two species which have golden stripes; but this colour fades soon after death even more than the green, which, when the insect becomes dry, turns to a brown or dirty yellow, with scarcely a tinge of green in it; while many of the exotics are so extremely brilliant, and their colours so permanent, particularly those from South America, that they are often set in gold and worn as jewels. The larvæ of these beetles have a very curious habit of sheltering themselves under a covering or umbrella of their own excrement, and this they can elevate or depress so as to shade or shelter them more or less effectually. With most

plant-eating larvæ the ejected excrement falls to the ground, but not so with the larvæ of the Tortoise Beetles ; at the end of the tail it has a sort of forked appendage which Kirby calls a *fæcifurk*. On this they place the excrementitious matter, which is then turned over the body, sometimes lying flat on the back ; at others it forms an acute, sometimes a blunt, angle with the body, or it may be unbent and in the same direction with it, it soon becomes dry, and is rapidly pushed forward by fresh excrement. In this way a kind of shield is formed, which completely covers the body, and so disguises its appearance that it requires a very practised eye to recognize it. As soon as this covering becomes too heavy and unwieldy, the creature throws it off, and another is soon formed in its place. There are amongst the exotic family of Cassididæ very many remarkable and curious forms of elytra, as also a great variety of metallic colouring ; such as *Mesomphalia illustris*, *M. festiva* and *dissecta*, *Batonia bidens*, *Alurinus marginatus* and *thoracicus*, *Coptocycla annularis* and *balyi*, *Dolichotoma ænea*, *Selene venosa*, *S. spinifex*, and many others."

Mr. Jenner Weir exhibited a bloom of *Narcissus cyclaminus* produced by a bulb collected in Spain, and remarked that it was interesting because this species had been described by Parkinson in his "*Paradisus terrestris*" in 1629, since which time it had been almost lost sight of, until Mr. Tait rediscovered it in Portugal, from which country Mr. Weir had also received it and bloomed it.

Mr. T. R. Billups stated that an unusually large number of the Hawfinch (*Coccothraustes vulgaris*, Pallas) had been recorded as occurring in the Forest of Dean.

Mr. Tutt remarked that after collecting for some years in the vicinity of London, he had come to the conclusion that there were as many forms of melanism to be obtained there as in any other part of the country ; he had taken *Mamestra abjecta*, Hb., at Greenwich, several of which were perfectly black ; *Agrotis nigricans*, L., were very much darker than those obtained on the coast ; *Miana strigilis*, Clerck, *Polia chi*, L., and *Acronycta aceris*, L., were additional examples that he could call to mind at the moment. He believed also

that the dark form of *Acronycta leporina*, L., was almost the only form of the species to be obtained in the woods round London. The species mentioned were only a few of those subject to melanism in the London district, and he thought the whole question was one well worthy of study and discussion.

Mr. Tugwell said that very dark forms of *Hemerophila abruptaria*, Thnb., and beautiful melanic forms of *Eupithecia rectangularata*, L., var. *nigrosericeata*, Haw., were obtained in the neighbourhood of London; and Mr. Carrington stated that in Hyde Park *Eugonia quercinaria*, Hufn., occasionally occurred of a mahogany colour.

APRIL 26th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. J. E. Pearce and J. Pearce were elected members.

Mr. H. T. Dobson exhibited a specimen of *Smerinthus tilia*, L., having the lower part of the central band of the superior wings absent.

Mr. J. Lea exhibited examples of *Hybernica leucophaea*, Schiff., and with reference to the remark on the small size of the species taken this spring, made by Mr. R. Adkin at the previous meeting, stated that all he had seen were far below the average size.

Mr. J. Jenner Weir read an extract from a letter addressed to him from Mr. Cockerell, and dated March 31st, referring to his note read at the meeting held on March 8th last, "On the origin of *Gonepteryx cleopatra*, L. :—

"I gather from Mr. Fenn that my note on the origin of *Gonepteryx cleopatra* was not quite understood at the South London Entomological and Natural History Society, and that you were unable to follow the argument. I will try to put it more lucidly. Proposition: That *Gonepteryx cleopatra* and *rhamni* are climate forms. Argument: (1) The original progenitor of the two species must either have had two seasonal forms, or else split into a northern (*rhamni*), and a southern (*cleopatra*) race in the course of its migration from the original locality. (2) If it had been simply influenced by climate like (say) the Scotch and South English species, which present different forms in those two districts, *inter-*

mediate forms would occur, and there would be no tendency for their extinction; on the contrary, the intermediate climate of the central portion of the species range would tend to preserve them.

“(2 b) But if *Gonepteryx* had had seasonal forms like those of *Colias eurytheme*, there *not* being a *succession* of broods, but only two in the year, no intermediate forms would arise, and the dimorphism would become stereotyped and ready, under altered conditions (*vide* former note), to produce two such *species* as *G. rhamni* and *cleopatra*.

“If this makes my meaning any clearer to you, and you think my view was not rightly understood from the former note, would you mind allowing the above to be read, or reading it yourself before the Society?”

Notwithstanding Mr. Cockerell has very clearly stated his argument, I find great difficulty in agreeing with him. *Gonepteryx rhamni* is not a northern species only, but on the contrary it inhabits the whole of Europe, except the Polar regions; and it is figured by the late Mr. Pryer in his “*Rhopalocera Niponica*,” the Japanese form apparently not differing from the European; further, the species is not double-brooded, nor is *G. cleopatra* I believe.

Mr. Cockerell imagines that the case is similar to that of *Colias eurytheme* and *C. keewaydin*; but both these are figured by Edwards in his “*Butterflies of North America*” as having the wings suffused with orange, although to a much greater extent in the former than in the latter species. Seeing therefore that *G. rhamni* and *G. cleopatra* exist over a large part of Europe in the same districts, and have a synchronous appearance in the latter part of the summer, and again after hibernation in the spring, I feel myself unable to accept his ingenious theory of the origin of the two species.

Mr. J. W. Slater read a paper, “*Nature’s Sanitary and Anti-Sanitary Services*,” of which the following is an abstract:—

“We too often fail to realize the vast quantity of organic refuse produced daily upon our globe as a necessary result of the existence of animal and vegetable life. Were this mass of matter—often offensive—not duly dealt with, we should, on the one hand, be surrounded with injurious nuisances, and, on the other hand, we should soon find the

totality of organisable matter locked up in effete forms, and life thus rendered henceforth impracticable. To prevent such a result the dead organism is eaten up by animals or absorbed by plants. The animals and plants thus employed may be termed '*Nature's scavengers*'; and, according as they do their work well or ill, they must rank as *sanitary* or *anti-sanitary* agents. Such beings may be found in almost all the divisions of the animal and vegetable kingdoms, from mammalia and birds down to microscopic fungi. Space will not allow me to enumerate them or to describe their varied and often curious ways of going to work. Suffice it to say that they form three classes: some, which bury polluted and offensive matters in the earth; some, which devour filth, but confine themselves to this diet alone; and some, which when besmeared with putrid and infectious matter, settle upon our persons and our food, and thus communicate disease and death. As examples of the first and best class we may mention the sexton-beetle, which buries the carcasses of small animals; and the dung-beetles, which carry down into the earth the excrement of various animals. As instances of the second class we may take the vulture, which devours putrid offal, but gives off from its body a most offensive smell. Lastly, in the third class we have the carrion and dung flies, which may be described as the colporteurs of pestilence. Towards these three different classes reason demands that we should adopt a totally different line of policy.

"But the subject, in addition to its practical importance, has also a profound speculative interest. The efficiency and completeness, or the deficiency and the shortcomings of Nature's agencies for dealing with refuse, throw valuable cross-lights upon the origin of species, and indeed upon the whole issue between the old and the new schools of Biology. The scavengers of the first class we should cherish, defend, and seek to multiply. Those of the second, except they are otherwise dangerous, like the wolf and the hyæna, we may tolerate and, under certain circumstances, we may even protect. Thus, when sanitary arrangements are defective, it is good policy to preserve vultures by legal enactments. But against the third class, the diffusers of disease, we should wage a systematic and untiring war.

“On careful examination we find that not every kind of nuisance finds, in the economy of Nature, some animal adapted for its perfect removal. Thus there is no generally diffused insect which buries human excretions, certainly not if in quantity. The dissolved pollutions in the waters are not duly met, and the tiny, solid impurities floating in the air seem also to be overlooked. Further, we find one and the same nuisance simultaneously attacked by burying-beetles, by *Silphæ*, and by blow-flies. Or animal droppings may be at once visited by *Geotrupidæ*, by *Brachelytra* and dung-flies. Now, what should we think of an army where part of the soldiers were equipped with the repeating breech-loaders, part with muzzle-loaders, and part with matchlocks? What would be our thoughts if we found the commanders anxious to keep up the number of the matchlock men, whilst allowing the regiments armed with breech-loaders to decrease? Or what should we think of a carrier who employed between the same two places, and for the same classes of goods, barges, stage-waggons, and pack-horses, giving continually a larger proportion of the traffic to the last? Yet these two imaginary cases are exactly parallel to what we actually observe in Nature’s arrangements for the disposal of offal.

“Further, let us suppose a city where the scavengers, night men, and knackers, after being engaged in their ordinary duties were allowed, without any previous cleansing and disinfection to act as surgeons, sick nurses, provision dealers, bakers, or cooks? Yet this is precisely what we observe in the animal world. The *Diptera* (two-winged flies) one moment plunging themselves into matters loathsome and infectious are in the next in close contact with our food and our persons. Thus we see that ‘Nature’s sanitary service’ does not form a well-organised system in which provision is made for every kind of nuisance, and where every task is committed only to that creature which is capable of executing it in the most perfect manner. On the very contrary, we find important matters overlooked, comparative trifles meeting with abundant attention. We see the true sanitary agents elbowed out of the field by imperfect rivals, who, like quacks, prosper in virtue of their own shortcomings. This state of things agrees ill with the old theory that the animal forms of

each country were each especially qualified for the discharge of some important function. But if that function is the propagation of pestilence, what then? If, with the new school, we regard the Fauna or Flora of any country as consisting of such species as have hitherto been able to hold their ground in their struggle for existence, and which possibly but incidentally render to man or to the world at large benefits or injuries, all becomes intelligible.

"We have further seen that there are animal forms depending for subsistence upon dead matter in every possible stage, from the scarcely cold carcase, or the fruit or leaf just fallen from the spray, on to the débris in which scarcely any trace of organic structure remains. Without a supply of such matter, these animals, as now constituted, could not exist. The sexton-beetle implies small dead vertebrate animals (or perhaps mollusks); the *Dynastidæ* pre-suppose the existence of decaying trees, and the *Geotrupidæ* that of herbivorous mammals. If, therefore, we assume that every animal has some especial and unalterable function for which its structure is specially adapted, the scavengers of Nature cannot have made their appearance until those animal and vegetable species, whose remains they were fitted to remove, had been for some time in existence, or had multiplied accordingly. The carrion feeders would have been in evil case had they come into being before deaths had become frequent. But if we suppose that animals in the course of generations adapt themselves both in structure and in habits to varying conditions this difficulty ceases. It is surely conceivable that animal forms which at one time preyed upon living animals or growing plants have, as the competition for food increased, gradually begun to subsist upon the dead remains of either, and have thus taken their place among Nature's scavengers. Thus a candid consideration of these creatures, their doings and their conditions of life, supplies us with valuable evidence in favour of the doctrine of Organic Evolution."

MAY 10th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. W. Martin was elected a member.

Mr. T. R. Billups exhibited specimens of *Hydaticus seminiger*,

De G., which, although not a rare, is a local species of the Family Dytiscidæ; it was taken by one of our members, Mr. Beaumont, at Lee, in Kent, where it has not been met with for some years, but was originally taken there in some considerable numbers.

An exhibition of microscopical objects was then given. Among the exhibits were those of Mr. H. Groves, Diatoms in situ, Mr. W. West (Streatham), ovaries of house-fly and developing tooth of a kitten, Mr. Dadswell, *Volvox globator*, *Stentor*, and *Vorticella*, Mr. Turner, Marine Algæ, and parasite of the turkey, Mr. N. D. Warne, scales of *Vanessa io*, Mr. Macer, spinnerets of *Epeira diadema* and living house-fly, Mr. R. Adkin, antenna of *Saturnia carpini*, Mr. T. R. Billups, *Litus cynipseus*, Hal., ♀, and *Cosmocomma ovulorum*, L., ♀.

MAY 24th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. A. H. Japp, LL.D., L. Stevens, and Coryndon Matthews, F.E.S., were elected members.

Mr. T. R. Billups exhibited a fine series of both sexes of *Bracon brevicornis* Wsm., parasitic on *Ephestia kuhniella*, Zell., and stated that Mr. Marshall once reared the female from the galls of *Andricus terminalis*, Fab. Mr. W. F. Kirby bred six males and one female from *Ephestia elutella*, Hub. Herr Brischke obtained a male from *Dioryctria abietella*, Zinck., while Mr. S. Webb, at Dover, also bred a male from *Myelois ceratoniæ*, Zell.

Mr. R. Adkin exhibited a fine series of *Asphalia videns*, Fb., bred from pupæ received from the New Forest. The specimens showed a considerable amount of variation; the most noticeable being one in which the base and outer third of forewings were almost devoid of markings, producing a strong contrast with the dark central band; while in others the wings were to a large extent covered by blackish-gray shades.

Mr. J. Jäger exhibited a larva of *Nemeophila plantaginis*, L., which he stated was one of many he had found in a dying condition, partially covered with what appeared at first sight to be a small species of fungus? On examination he had discovered a small larva, with which he was unacquainted, emerging from that of the lepidopteron. Mr. Tugwell stated

that he had met with a similar instance when rearing the larvæ of *Lasiocampa quercifolia*, L. Mr. West, of Streatham, said the small larva was that of the hair worm (*Gordius*), the ova of which had probably been swallowed by the lepidopterous larva when feeding.

Mr. H. J. Turner exhibited eggs of the Dartford Warbler (*Melizophilus undatus*, Boddaert.), from Godalming; the Wheatear (*Saxicola ænanthe*, L.), from Red Hill; the Tree Pipit (*Anthus trivialis*, L.), from Box Hill; the Long-tailed Tit (*Acredula caudata*, L.), and an egg which had not been identified. He stated that the nest from which this egg was taken was something similar to that of the Goldcrest (*Regulus cristatus*, Koch).

Mr. Turner further remarked that the Dartford Warbler and Wheatear were becoming very scarce in Surrey. Mr. Tugwell expressed an opinion that this was not the fact, and thought it was owing to the shyness of the birds that they were not noticed. Mr. Carrington said he had recently been walking over Dartford Heath with Mr. Farn, who pointed out several places where he had observed the nest of the Dartford Warbler, and who added that it bred in the neighbourhood each year, and with regard to the Wheatear, Mr. Carrington was of opinion it was as abundant now as it had ever been. The discussion was continued by Messrs. Tutt, South, Step, and Rice.

Mr. F. G. Fenn read a paper on "British Land and Freshwater Shells."

JUNE 14th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. A. Robinson exhibited ringed forms of the larvæ of *Trichiura cratægi*, L., from Monkswood, and asked whether this was a common variety.

Mr. Tugwell said the larvæ of this species were exceedingly variable.

Mr. West (Streatham) exhibited a species of *Noctua*, bred from a larva taken in Switzerland, at an elevation of 5000 feet; he thought the specimen was a typical example of *Acronycta leporina*, L. Mr. South and Mr. Tugwell concurred.

Mr. P. F. J. Lowrey exhibited a male specimen of *Tæniocampa stabilis*, View., taken in copulâ with a female of *T. gothica*, L., at sallow bloom, Darenth Wood, Kent. He stated that ova were obtained, only a portion of which hatched, and the larvæ subsequently sickened and died.

Mr. F. G. Fenn, on behalf of Mr. T. D. A. Cockerell, exhibited the following Lichens: *Peltigera horizontalis*, L., *Placodium elegans*, Link., also an undetermined species of *Omphalodium*, and the following notes from Mr. Cockerell were read:—

“The two specimens exhibited are interesting as illustrating the wide distribution of lichens. *Peltigera horizontalis*, L., was gathered at Naomi, Summit Co., Colorado, on September 1st, where it was growing in some abundance close to the creek, at an altitude of over 8,000 feet.

“*Placodium elegans*, Link., placed by some authors in the genus *Lecanora*, is the orange lichen on the twig, the dark brown one being an undetermined species of *Omphalodium*. This lichen was found early in October, by Surface Creek, in Delta Co., at about 8,500 feet altitude. Both these species are British, as I find *P. horizontalis* recorded from Westmoreland, and *P. elegans* has been gathered in the Grampian mountains in Scotland.

“I met with three species common to the British fauna on Surface Creek—*Vanessa antiopa*, L., among the insects; *Conulus* (or *Zonites*) *fulvus* Müll., and *Pisidium pusillum*, Gmel., among the mollusca; while the British flowering-plants were represented by no less than seven species—*Fragaria vesca*, L., *Epilobium angustifolium*, L., *E. alpinum*, L., *Veronica serpyllifolia*, L., *Achillea millefolium*, L., *Campanula rotundifolia*, L., and *Chenopodium rubrum*, L. The English magpie, also, had its representative in the larger American form *Pica rustica* var. *hudsonica*, Scop.”

Mr. J. T. Williams called attention to the abundance of larvæ of *Bombyx neustria*, L., and mentioned that he had noticed a number of hybernated specimens of *Vanessa cardui*, L. Reference was made by several Members to the unusual abundance of many species in the larval stage, and to the number of imagines of *V. cardui*, observed in different localities.

The Secretary read the following note from Mr. T. D. A. Cockerell:—

“Query as to a White-banded variety of *Sesia culiciformis*, L.—Looking over some numbers of the *Field* to-day, I came across (1887, p. 828) some notes by Mr. F. W. Frohawk on the past season, wherein he casually mentioned having taken a “white-banded” example of *Sesia culiciformis* at West Wickham. Hitherto, I have always classed the bands of the *Sesiidæ* with the hind wings, etc., of *Arctia*, *Zygæna*, etc., as exhibiting a pigment, common to all, which was dimorphic, the two forms being yellow and red. And we know that some species of *Sesia* have yellow and some red bands, and further, that occasionally a normally red-banded species will have this portion yellow; but that it should vary to white was quite unexpected and unknown to me. Therefore, as it is clearly a matter having considerable bearing on our views concerning the band-pigment of *Sesia*, I put forth this query—are white-banded *Sesiæ* known to any of the Members of this Society? and is the specimen referred to in the *Field* known anything of? Any information on this subject will be of great value.”

Mr. Tugwell said he had had considerable experience of the genus *Sesia*, and a white-banded variety of *S. culiciformis* was unknown to him; but a pale yellow lemon-banded form was not rare. Mr. J. T. Williams stated he had never bred any but the usual form of the species; Mr. T. W. Hall, although he had bred some of a lightish yellow, had never seen anything approaching even a cream colour; Mr. Tutt was of opinion that Mr. Frohawk had made a mistake as to the identity of the insect, and should he be right as to this, the change of colour might be due to some chemical. Upon the suggestion of Mr. R. Adkin, the Secretary was instructed to write to Mr. Frohawk, requesting him to exhibit the specimen in question at a future meeting. (See page 57.)

JUNE 28th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Miss M. Kimber and Mr. A. E. Hall were elected members.

Mr. W. H. Tugwell exhibited examples of *Spilosoma menthastris*, Esp., var. *ochracea*, White., bred from Dundee parents, the larvæ having been fed on stinging nettle (*Urtica dioica*, L.).

Mr. D. J. Rice exhibited the nest of a Robin (*Erithacus rubecula*, L.), made in an old kettle; nest and eggs of Hawfinch (*Coccothraustes vulgaris*, Pallas), taken in the Leith Hill district, where he stated the latter bred regularly.

Mr. Tugwell mentioned that he had recently bred several specimens of *Sesia sphlegiformis*, Fb., the larvæ having been found at Tilgate Forest, Sussex. He was of opinion that the species spent three years in the larval stage. The ova being deposited on alder stems at the end of June or beginning of July, hatch in a few days. The young larvæ feed on the inner bark, and may be found quite small the following spring, throwing out tiny threads of frass through the bark. They feed all through next season, burrowing between the bark and woody stem. The third year they eat well into the centre of the wood, and towards the end of the season they form a channel out to the bark again, always working upwards, but do not pierce the bark. They remain as full fed larvæ until the beginning of the May following, when they pupate near the end of the burrow, and appear as imagines in June, so that as larvæ they live some thirty-four months. It is quite useless to collect the larvæ until the spring of the year in which they pupate, and with best success after that stage. To collect them young is only to sacrifice them!

JULY 12th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Messrs. A. L. Clark, W. B. Farr, and R. Atherton, were elected members.

Mr. Weir exhibited a male specimen of *Lycæna icarus*, Rott., which he had taken at Lewes in June last. It was remarkable as showing a slight tendency to hermaphroditism; there were on the upper side of the under wings two well-defined and several smaller submarginal spots; the colour of all the wings in other respects was that of an ordinary male of the species. His attention had been drawn to the insect by a male of the

same species, evidently by its actions mistaking the specimen exhibited for a female.

Mr. South did not suppose the specimen was anything but a male, the males of the blues and many other species frequently toyed together in the way mentioned by Mr. Weir. Mr. Tutt stated he had frequently taken this variety at Deal; on one occasion he obtained fourteen or fifteen examples of it. Mr. Weir referred to the invariability of the species round Lewes, as compared with the said extreme variability at Deal. Mr. South added that for four years he visited the Isle of Wight, and never failed to examine large numbers of the species now referred to, and had only once found anything approaching the variety shown this evening. Mr. Carrington was of opinion that some allowance should be made for the difference in the geological formation of the localities now referred to.

Mr. Dobson exhibited *Notodonta chaonia*, Hb., bred from pupæ obtained in the New Forest in 1888, when it was very plentiful; from the small number of imagines taken this year, he was of opinion that the pupæ were standing over.

Mr. Carrington observed, that it was not at all uncommon, for members of this group to remain in pupæ for more than one season.

Mr. A. Robinson exhibited a pink example of *Miana strigilis*, Clerck., from Monkswood. Mr. R. South remarked that a very large pink form of this species occurred in N. Devon, which might at first glance be taken for *M. literosa*, Haw.

Mr. Jäger exhibited preserved larvæ of *Callimorpha hera*, L., from Devonshire parents.

Mr. W. West (Greenwich) exhibited *Colymbetes notatus*, Berg., *Cercyon aquaticus*, Mull., and *Heterocerus obsoletus*, Curt., taken on the Salt Marshes, Milton, near Gravesend, Kent.

Mr. Rice exhibited eggs of the Red Legged Partridge (*Caccabis rufa*, L.); nest and eggs of the Wood Pigeon (*Columba palumbus*, L.); and eggs of Nightjar (*Caprimulgus europæus*, L.), the last from the Leith Hill district.

The Secretary, on behalf of Mr. T. D. A. Cockerell, exhibited a coloured sketch of a Thomisid spider on the flower of *Ligusticum montanum*, found in Custer Co., Colorado; and read the following note:—

"Numerous cases of mimicry and deceptive likeness to surroundings are known to occur in the spiders belonging to *Thomisus* and allied genera, and it may therefore be of some interest to record an additional case which has recently come under my observation in Custer County, Colorado. There is a yellow-flowered umbelliferous plant—*Ligusticum montanum*, Benth. and Hook.—which is very frequent by the creeks, and a careful search will reveal specimens of a yellow spider of moderate size, seated in the slight depression in the middle of the disc of the umbel, never more than one spider on a single disc. These spiders also frequent the yellow blossoms of certain species of Cruciferae growing in the same neighbourhood; and in all cases, when seated on the flower, resemble it in colour so closely as to be quite unnoticeable unless specially looked for. Now, whenever an insect settles on the flower, the spider makes a spring and grasps its victim, nor lets go again until he has made a meal of its life juices. This afternoon I noticed a small *Pamphila*, allied to the European *P. comma*, which did not fly off from the yellow flower it was on when I approached. Wondering at this, I stooped to examine, and certainly it was in the fatal grasp of a yellow spider, and by that time quite dead. The flowers of *Ligusticum* in this locality are much frequented by a pretty beetle—*Trichodes ornatus*, Say., and a prettier green *Chrysis*; but I have not yet observed the yellow spider to capture these, though no doubt it does so. Mr. Wallis Kew has recorded (*Ent. Mo. Mag.*, vol. xxiii., p. 136) that *Chrysis ignita* is preyed upon by a spider (*Xysticus cristatus*) in Lincolnshire. The sketch accompanying this note, although rough, will give some idea of the appearance of the spider on a *Ligusticum* flower."

Mr. Weir said similar spiders were not at all uncommon on flowers in England. There were several species closely resembling the flowers on which they were sitting for the purpose of obtaining their food. Mr. Tugwell had noticed corresponding instances in the New Forest. Mr. Step had seen a white species on the flowers of umbelliferous plants. Mr. South had also frequently seen them in the umbels of what was commonly called cow parsnip—*Heracleum sphondylium*, L.

JULY 26th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. T. S. Hillman was elected a member.

Mr. J. T. Carrington exhibited a specimen of *Sirex gigas*, Fab. Mr. West (Greenwich) stated he had several times taken the species drying its wings on willow trees near London.

Mr. W. H. Tugwell exhibited *Eupithecia extensaria*, Frr., also very dark specimens of *Melanippe fluctuata*, L., from Pitcaple, known as the var. *neapolisata*, Mill., together with examples of the Southern form of the species.

Mr. Robson, a variety of *Argynnis euphrosyne*, L., taken by Mr. Waller at St. Mary's Cray, Kent. Plate I, fig. 3.

Mr. Frohawk exhibited the white-banded variety of *Sesia culiciformis*, L., referred to in Mr. Cockerell's note read at the meeting on 14th June.

The Secretary read the following further communication on the subject from Mr. Cockerell:—

“White pigment in the Sesiidæ.—The species of the genus *Sesia* have black bodies with coloured bands, and these bands are usually red or yellow, the pigments being presumably the same as the red and yellow pigments of the Zygaenidæ and Cheloniidæ. *Sesia culiciformis*, L., is a red-banded species, but has an occasional variety (*lutescens*), in which the banding is yellow, a fact which agrees well with the view that the red and yellow pigments are forms of one. But this is not all; Mr. Frohawk in *The Field*, 1887, p. 828, alludes to a ‘white-banded variety’ of *S. culiciformis* which he found at West Wickham. This white banding in *Sesia* struck me at the time I read of it as very curious, but it is not unique, for the banding in *S. andreniformis*, Lasp., is stated to be ‘white or pale yellow,’ and that of *S. sphegiformis*, Fb., is white. So it really now appears that if there is good reason to believe the pigment in question to be *dimorphic*, red and yellow, there is equally good reason to suppose it *trimorphic*, red, yellow and white, unless indeed these white forms (which I have not seen) are due to albinism or *absence of pigment*. The same variation to white occurs also in *Arctia caia*, L., for H. Strecker states that this species in

North America has a white collar but in Europe this occurs only very occasionally. On the other hand, in Europe and America the hind wings are red ; but in Asia Minor (Amasia and Tokat) the males have them pure white. All this is very interesting ; but it is desirable to collect more information as to the variation from red and yellow to white in the Sphinges and Bombyces before venturing on any definite conclusions, and it is with the hope of obtaining such that I have written this note."

Mr. Tugwell remarked that he had never previously seen a white-banded specimen of this species, and it was an exceptional variety ; the colour of the band in Mr. Frohawk's specimen was a pale creamy white, very much the same tone of colour as prevailed in the band of *S. sphaeriformis*. In *Nemeophila plantaginis*, L., var. *hospita*, Schiff., we have another example of variation from yellow to white.

AUGUST 9th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Messrs. R. Waller and J. N. Young were elected members.

Mr. C. A. Briggs exhibited a series of *Zygæna meliloti*, Esp., taken in the New Forest during the year by Mr. Meek, who had stated that the species occurred in a different spot from that where it had been previously obtained.

Mr. J. T. Carrington exhibited *Venusia cambrica*, Curt., and *Boarmia repandata*, L., from Sheffield, and said that they were remarkable on account of their melanic appearance. Mr. Wellman had informed him that he had a similar specimen of the first-named species, from the same neighbourhood, which was almost as dark as the one shown.

Mr. Weir thought a great deal of interest attached to this exhibit, as many species received from the north of England showed a great tendency to melanism. The point was whether the action was direct or indirect ; whether melanism arose from the smoke cutting off the sunbeams, coupled with the dirty state of the tree trunks through the deposit of soot, and whether in consequence the insects became darker because they were more easily concealed. Mr. Wellman, having from the same locality received these dark insects, showed some cause at work to produce this darkening ; but it was an open

question whether it was direct or indirect. Mr. West (Greenwich) remarked that upon a tarred fence, nailed up to which were some currant bushes, he always found the larvæ of *Abraxas grossulariata*, L., absolutely black, having no spots whatever, but the imagines bred from these larvæ were always typical. Mr. Carrington said the question was whether animals had the power during a single lifetime to adapt themselves to their surroundings; and if so, to what extent. One could not understand why the moth was able to do so except from the reason Mr. Weir suggested, that those who survived were those that adapted themselves to their surroundings for protective purposes. When he was at the Royal Aquarium, he remembered some soles and plaice being brought there: the soles harmonized with the colour of the sand at the bottom of the tank in which they were kept; but the plaice, which were taken at the mouth of the Thames, were of a delicate brown colour with very few spots, but being placed in a tank having a gravel bottom with some white stones among the gravel, within twelve hours the plaice were covered with brilliant spots imitating the colour of the gravel. This was not a solitary instance; the experiment was carried on for some considerable time, and in every case the fish changed to the colour of the gravel at the bottom of the tank. He could understand that the fish were more highly organized than moths; but if one animal was capable of doing this, he did not see why another should not. The fact that Mr. West took absolutely black larvæ of *A. grossulariata* from a tarred fence, and also that black larvæ of the same species were every year found in the neighbourhood of Newcastle-on-Tyne, seemed to suggest that the individual had power to adapt its colour to its surroundings. Mr. Weir said that the larger newt, if taken from a pond and placed in a white basin for two or three hours, would lose its colour. Mr. West (Streatham) said the small cuttlefish had power to change its colour; if placed in a white receptacle it would turn almost the same colour, and he believed that the stickle-back changed its colour in the same way. Mr. Step had frequently noticed that if he took a toad from Wimbledon Common and placed it in his garden, the soil of which was much lighter than that of the Common, it would soon change

its colour so as to be very difficult to detect ; this was known to take place frequently among the Reptilia.

Mr. A. E. Cook exhibited a variety of *Smerinthus tiliæ*, L., the lower part of the central band on the primaries being absent.

Mr. J. Jenner Weir exhibited *Myrmeleon europæus*, L., bred by him from larvæ he obtained at Fontainbleau in 1887.

Mr. J. Jenner Weir read an extract from a letter addressed to him by Mr. Cockerell, dated 21st of May, 1888, refering to Mr. Cockerell's theory that *Gonepteryx rhamni* and *Gonepteryx cleopatra* originated as seasonal races, or as he should term it, horeomorphic races ;—

“(1) I take it that dimorphism in animals is something like the case of certain salts which are dimorphic in the crystals ; that is to say, as the salt may crystalize either as a cube or octahedron (say), so the primitive germ *may* develop either into one form or the other, and a very good instance of this is the familiar case of male and female (in fact the sexes remain undifferentiated till quite late in embryonic life). Now this differs from *simple variation*, which is wholly the result of circumstances ; it is doubtless *originally* a case of simple variation, but when it has reached the stage we call dimorphism, the effect of outside influences is like a small weight in the balance, determining which tendency shall prevail, and originating no new character.

“(2) Therefore, the mere fact of two species flying together is favourable, rather than otherwise, to the view that they arose as dimorphic varieties ; because two species could not have been produced under the same conditions by ‘simple variation,’ unless by natural selection, which is improbable in the present case.

“(3) In certain districts of America *Colias eurytheme* and *Colias keewaydin* fly together and at the same time, though otherwise they are alternating seasonal races (vide W. H. Edwards' *Butterflies North American Colias*, iv.) ; so much for the two species flying together.

“(4) Is it certain that *Gonepteryx cleopatra* is never double-brooded ? But if it is not, I do not see any difficulty in supposing our originally double-brooded species becoming single-brooded ; and to prove this possibility I will take the same species that you have taken, viz., *Pieris napi*.

"We have in America, as in Europe, the one-brooded. *P. bryoniæ* in the far north, which is an exaggeration of the winter form *Oleracea hyemalis*, and *venosa* of the double-brooded species further south. Then there are the summer broods of these last, viz.: *Oleracea æstiva* and *pallida*; and finally in West Virginia the single-brooded *virginiensis*, which is an exaggerated *Oleracea æstiva*. This insect comes out in spring, and is single-brooded like *Gonepteryx* or *Anthocharis*.

"So to tabulate *Pieris napi* in America:—

SINGLE-BROODED.	WINTER BROOD.		SUMMER BROOD.	SINGLE-BROODED.
Northern, <i>bryoniæ</i> .	Eastern, <i>oleracea</i>	and	<i>oleracea æstiva</i> ,	Southern, <i>virginiensis</i>
	<i>hyemalis</i>			Western <i>venosa</i> and <i>pallida</i> .

Eliminate the double-brooded race, and you have *bryoniæ* like *G. rhamni*, and *virginiensis*, like *G. cleopatra*!

"Now I do not pretend that these cases are exactly parallel, or that the two-brooded *napi* is likely to be lost; but to my mind, it is sufficiently like the hypothetical case of the two species of *Gonepteryx* to be convincing of the possibility of my theory.

AUGUST 23rd, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. H. A. Cruttwell was elected a Member.

Mr. J. T. Williams exhibited nine specimens of *Deilephila galii*, Schiff., taken by him at St. Margaret's Bay, Kent; and stated that Mr. F. Oswald had taken eight others; the whole number were taken flying over flowers of *Echium vulgare*, L.

Mr. Wellman exhibited bred examples of a second brood of *Lobophora viretata*, Hb., *Rhodophæa advenella*, Zinc., and also a melanic specimen of *Venusia cambrica*, Curt., from Sheffield, which was referred to at the previous meeting, and specimens of *Sesia culiciformis*, L., with yellow bands.

Mr. R. South exhibited a melanic example of *Plusia gamma*, L., and called attention to a curiously serrated line on the hind margin of the primaries, which formed a distinct metallic W.

Mr. D. J. Rice exhibited nest and eggs of the Creeper (*Certhia familiaris*, L.); and eggs of Wren (*Troglodytes parvulus*, Koch.).

The Secretary, on behalf of Mr. T. D. A. Cockerell, exhibited specimens of *Trichodes ornatus*, Say., *Chrysis pacifica*, Say., and *Cantharis nuttalli*, Say., from Colorado, and read the following note:—

“*Cantharis nuttalli*, Say. This species of *Cantharis*, kindly named for me by Prof. C. V. Riley, is exceedingly abundant in this locality (Custer Co., Colorado), being gregarious on low plants and very conspicuous. W. L. Carpenter has already recorded this species from Colorado (Ann. Rept. U. S. Geol. and Geog. Survey for 1873), and he states that he found it only very locally in South Park, where it was confined to *Iris missouriensis*, Nuttall (or as he calls it, “*Iris tenax*”), and seemed to be protected by its resemblance to the colour of that plant. I cannot, however, quite agree with this view, because here it is certainly a very conspicuous beetle, and yet does not appear to be eaten by birds—indeed one might well suppose that a species of *Cantharis* would not be palatable. Neither is *C. nuttalli* always confined to *Iris*—I have indeed found it in plenty on *Iris missouriensis* here, but even more abundantly on leguminous plants—particularly *Thermopsis* and *Oxytropis lamberti*.

“The other two species of insects exhibited are *Trichodes ornatus*, Say., and *Chrysis pacifica*, Say.,—mentioned in a former note read before the Society as being frequent on the flowers of *Ligusticum montanum* in this locality. I have also observed both species on *Geranium fremontii*, but more rarely, and on one occasion I found *T. ornatus* on the flower-head of *Achillea millefolium*.”

The Secretary also read the following notes from Mr. T. D. A. Cockerell:—

“The genus *Euchloë* (= *Anthocharis*).—Darwin, in the *Descent of Man* remarks that although the males of certain species of this genus have orange-tips, those of others, like the females, lack them, and suggests that these latter are nearer the original type of the genus. *E. ausonides*, Bdv., a species found in this locality, and ranging northward to Alaska, is one that lacks the orange tips, and is probably the most

primitive form of *Euchloë* we have, since the larva, which I have been fortunate in discovering this year, is almost exactly like that of *Pieris protodice*, Bd. and Lec., a species which flies in the same locality and lays its eggs on the flower-heads of the same plants. Indeed, I sent Mr. W. H. Edwards a number of larvæ which were supposed to be those of *protodice*, from which he got pupæ of *protodice*, sure enough, but also a pupa of *ausonides*! And he wrote me that he had not noticed any difference in the larvæ, except that he sometimes thought some were blacker—had more black hairs. This interesting fact, together with others (which I shall give in detail elsewhere), has led me to suppose that *Euchloë* arose from an ancient *Pieris*-stock, which is now most nearly represented by *P. protodice* and its allies, and that the separation took place on the American Continent.

“Can insects distinguish between red and yellow?—Some weeks ago I wrote a note, which has been read before this Society, on the habits of a certain yellow *Thomisid* spider, common in this locality, remarking that it seated itself on yellow flowers, and so concealed, captured the insects that alighted on them. Since then I have also found examples of this same yellow spider seated on the flowers of *Geranium fremontii*, which are of a pale pink colour, and this suggests an inquiry, can spiders and insects distinguish between red and yellow? It is conceivable that the ancestors of *Geranium* were yellow, and that the habit of sitting upon these flowers was acquired at the time by the ancestors of this yellow spider—for although I do not remember to have seen or heard of any yellow flowered *Geranium*, it is worthy of note that *Oxalis*, in the same natural order, has both pink and yellow flowered species. But allowing this possibility, it still remains to be asked, does this yellow spider seat himself upon a pink flower because he cannot tell it from a yellow one? and further, can the insects which visit these flowers distinguish between the yellow of the spider and the pink of the flower, and so perceive and elude their enemy? Some time back I noted in the *Entomologist* that the yellow *Gonepteryx rhamni* was especially fond of settling upon pink flowers, but it rather appeared that the insect was aware of the conspicuous contrast between these colours. I venture to think this inquiry

is not without interest to Entomologists, and I hope that some information, in addition to that now given, may be elicited from members of the Society—principally, whether they have noticed a fondness or otherwise of yellow insects for pink flowers, and whether the insects seemed aware of the difference between these two colours.”

SEPTEMBER 13th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. J. H. Keys was elected a member.

Mr. H. A. Auld exhibited a large number of *Dicycla oo*, L., taken at sugar, near Hayes, Kent, on the 10th August last.

Mr. Turner exhibited a melanic specimen of *Boarmia gemmaria*, Brahm, taken at Ashdown Forest.

Mr. Elisha exhibited fine series of the following Tortrices: *Argyrolepis æneana*, Hb., *A. zephyrana*, Tr., *Eupæcilia atricapitana*, St., *E. amandana*, H.-S., *Retinia turionana*, Hb., *Catoptria juliana*, Curt., *Phoxopteryx derasana*, Hb., *Ephippiphora trigeminana*, St., and *Carpocapsa pomonella*, L., the last named bred from berries of the white beam tree (*Pyrus aria*, Sm.), also the following Tineæ, *Nematois fasciellus*, Fb., *Cerostoma horridella*, Tr., *C. alpella*, Schiff., *Coleophora therinella*, Tgstr., and *Gelechia semidecandriella*, Threlfall, the last-named bred from *Cerastium tetrandrum*, Curt.

Mr. Wellman exhibited bred examples of *Noctua sobrina*, Gn., from Perth; *Dianthæcia irregularis*, Hufn., from Cambridge.

Mr. R. South exhibited *Lycæna icarus*, Rott, from Durham and Rannoch, and read the following notes:—

“The short series of *Lycæna icarus* from the county of Durham which I exhibit this evening, shows not only the ordinary forms of the species, but some which, so far as my experience of *icarus* will warrant an opinion, are by no means common forms, but on the contrary, most interesting aberrations. As a whole the series, limited in number as it is, may be regarded as a fair sample of *Lycæna icarus* occurring in the neighbourhood of Bishop Auckland and Castle Eden. The most notable examples perhaps are the fourth B.A., ♂ and the third B.A., and fourth C.E., ♀’s in row 1. The male referred to has very distinct patches of black in the fringes,

and the females, which are exactly similar aberrations, have all the under-surface markings of the primaries reproduced on the upper surface of these wings, minus the black central dots.

Aberration in under-surface ornamentation was principally in the direction of the obsolete, but one specimen exhibited is itself a not very good exponent of the three phases of aberration I have discussed elsewhere. This example has an extra basal spot on primaries, is minus one or two on secondaries, and on the same wings has the initial spots of basal and central series united.

For the Rannoch specimen of *L. icarus*, I am greatly indebted to my kind correspondent, Mr. Ellison of Perth, who was good enough to send me some sixty or seventy examples. From these I have picked out all the males that exhibit any trace of black dots or spots on the hind margins of the inferior wings. There are just fourteen individuals which have these spots developed in a greater or lesser degree.

I was aware that this form of *L. icarus* occurred in Scotland and also in Ireland, at least, that part of Ireland which embraces Culleenamore. I also knew that the south of England produced it, as I found one last June at Ventnor; but I am yet in the dark as to the occurrence of this form of *Lycæna icarus* in other parts of England, and shall be glad if any member of this Society can give me the necessary information. I think I understood Mr. Tutt to say here that such forms were not uncommon in England. I should much like to have a few localities, as I am anxious to learn something more about the English distribution of this form.

Mr. Tutt said that he always obtained a fair percentage of them at Deal, Kent.

Mr. Step exhibited galls of *Aulax glechomæ*, Hartig., on the leaf stalk of Ground Ivy (*Nepeta glechoma*, Bentham) from Epsom.

SEPTEMBER 27th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. J. Jäger exhibited three specimens of *Callimorpha hera*, L., bred from ova obtained from a female of the species cap-

tured at Starcross, Devon, in 1887; and a fine series of *Stilbia anomala*, Haw., taken at Sandersfoot, South Wales.

Mr. Auld exhibited an example of *Callimorpha hera*, L., taken flying in the sunshine at Dawlish, Devon; also two specimens of *Vanessa io*, L., with an additional blue spot below the ocelli.

Mr. Tugwell exhibited living larvæ of *Deilephila galii*. Schiff., and remarked that he had met with this species in some numbers at Deal, feeding on *Galium verum*, L., a few also on *G. mollugo*, L. They were distributed over a considerable area, extending from St. Margaret's Bay on the south-west, to Pegwell Bay on the north; not only were they found near the sea line, but in places five or six miles inland. During his three weeks' stay at Deal, he and his family had by diligent search collected some 200 of the larvæ. They varied immensely in colour and marking, and included the eight forms figured in Buckler's *Larvæ*; also several other varieties. In some, the usual pale yellow or creamy white sub-dorsal spots were replaced by a bright rose-pink colour. Three were entirely black, without any markings; and two, half grown larvæ, had the sub-dorsal markings much freckled with violet, making them extremely handsome.

The year 1888 will be known to Lepidopterists as the great *galii* season. In 1859, and again in 1870, *D. galii* larvæ were found in some numbers at Deal; but they were sought for in vain in intermediate years. He had spent much time, season after season, over the same ground, without finding a trace of them.

OCTOBER 11th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. W. H. Bennett and E. D. Y. Poole were elected members.

Mr. T. R. Billups exhibited two species of British Fossorial Hymenoptera, namely, *Ceratophorus morio*, V. de Lind, with its var. *anthracinus*, Sm., taken in his garden at Peckham; and two specimens of *Nysson dimidiatus*, Jur., from Chobham. Also four specimens of *Nomada roberjeotiana*, Panz.

Mr. Tugwell exhibited *Epischnia farrella*, Curt., and *Crambus alpinellus*, Hb., from Kings Lynn, and an albino example of *Thera firmata*, Hb., from Scotland, of which the following is a description:—The ground colour of all the wings much paler than the type, and the usual ochreous central fascia reduced to the faintest outline, fringe white.

Mr. J. Jäger exhibited Lepidoptera captured by himself at Tenby in South Wales, 1888, among which was a variety of *Argynnis paphia*, L., with two white blotches on both wings on one side. Also of *Satyrus semele*, L., having black spots instead of the usual ringlets; *Vanessa io*, L., with blue spots below the lower ocelli of hind wings, and *Colias edusa* var. *Helice*, Hb., captured by himself in South Wales.

Also types of *Agrotis lunigera*, Steph., and *A. ripæ*, Hub.; and remarked that the last-named species was very common at sugar, and on the lamp-posts, around Tenby at the end of June, whilst the larvæ were plentiful on the sandhills in August and September, feeding on Sea-holly (*Eryngium maritimum*, L.) and Prickly Saltwort (*Salsola kali*, L.).

Mr. J. H. Carpenter exhibited a slate coloured specimen of *Amphipyra pyramidea*, L.

Mr. Elisha exhibited bred specimens of *Argyrolepis maritima*, Gn., and *Cidaria reticulata*, Fb.

Mr. R. Adkin exhibited several twigs of Scotch Fir (*Pinus sylvestris*, L.) which had attached to them resinous nodules containing larvæ of *Retinea resinella*, L., from Forres.

Mr. F. G. Fenn exhibited *Helix hortensis*, Müll. *mons. sinistrorsum*, Taylor, taken at West Drayton, October, 1888.

Mr. Step exhibited specimens of *Limax maximus*, L., and *L. agrestis*, L., killed in a solution of mercuric bichloride, which, he stated, had the effect of preserving them in the same position as they were in when placed in the solution.

OCTOBER 25th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. E. A. Atmore was elected a member.

Mr. C. A. Briggs exhibited *Gnophos obscuraria*, Hb., the ordinary form and a particularly fine series of the banded form from Folkestone, the pale form from Lewes, the dark form from the New Forest, and a similar form from Ascot.

Mr. Wellman, on behalf of Mr. A. E. Hall, exhibited a number of *Lycena icarus*, Rott., taken in a field near Edlington Wood, Doncaster, in July; the female specimens were very striking in colour, some being almost as blue as the males, and the others being of various shades between these and the ordinary form.

Mr. O. C. Goldthwaite exhibited a specimen of *Triphæna orbona*, Hufn., and white spotted forms of *Argynnis paphia*, L., from the New Forest.

Mr. C. Oldham exhibited a variety of *Chærocampa porcellus*, L., from Epping Forest, which had the pink blotches along the costal margin of the fore wings narrower and of a much lighter shade than the type; whilst the broad outer margins were somewhat indistinct.

Mr. Tutt, on behalf of Mr. P. Russ of Sligo, exhibited *Agrotis tritici*, L., showing a good deal of variation; *A. cursoria*, Bork., showing variation, from type to specimens with a distinct dark spot in the centre of the wing; and var. *sagitta*, Hb., with intermediate forms. *Epunda lutulenta*, Bork., showing two very characteristic phases of variation, one of a fine steely grey colour covered with white scales, with a distinct band, black in ground colour, with the hind wings white; the ♀'s of this variety are especially dark, the anterior and posterior wings being equally black. Mr. Tutt remarked that the pale Continental form did not appear to occur in Britain, but that the palest as well as the darkest of our specimens were named varieties on the Continent; v. *sedii*, Gn., and v. *luneburgensis*, Frr., being the best known forms.

Mr. Oldham exhibited several specimens of *Calosoma inquisitor*, L., which he stated were all taken from one birch tree in Epping Forest.

Mr. West (Greenwich) exhibited *Thalycra sericea*, Sturm., from West Wickham, Kent.

Mr. Carrington exhibited a skin of Pallas' Sand Grouse (*Syrrhaptes paradoxus*, Pall.), and remarked that Mr. Cooper had received specimens of this rare bird, which, as was well known, had immigrated westward from the central portions of Asia, where it was usually found in considerable numbers. Mr. Jobson had pointed out to him, that in years when the bird occurred in this country, which were unfortunately few and far between, *Deilephila galii*, Schiff., also occurred in some numbers.

Mr. Cooper said it might interest the meeting to hear that he had received a letter during the week, stating that in a locality which he was not at liberty to mention, where Pallas' Sand Grouse had been very plentiful in the spring, they were still to be seen in good numbers, and it was very probable that nests would be found.

NOVEMBER 8th, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Messrs. H. W. J. Vaughan, F.E.S., W. Warren, M.A., F.E.S., W. D. Cansdale, F.E.S., C. Fenn, F. Oswald, H. A. Sauzé, A. Short, H. E. Hopkins, D. Chittenden, and S. Webb were elected members.

Mr. Wellman exhibited *Acidalia aversata*, L., the specimens being examples of a second brood bred from ova obtained from moths taken by him in the neighbourhood of Brixton, and included plain, banded, and reddish forms.

Mr. Tutt, on behalf of Mr. T. A. Chapman, exhibited *Acronycta tridens*, Schiff.; a long series of 80 bred specimens from Hereford, some with a beautiful rosy tinge, others showing a great deal of variation in the character of the discoidal spots, and in the character of the basal mark; a long series of *A. psi*, L., from the same locality for comparison, together with an exceptionally dark specimen of *A. megacephala*, Fb.

Mr. Tutt stated that Mr. Chapman had said the larvæ of *A. tridens* and *A. psi* were very different. Mr. Tutt thought most of the specimens taken in the London district were *psi*, but those taken in the Rochester district in nine cases out of

ten were *tridens*; he could not point out any characteristic difference; but was of opinion that if a long series of the two species were studied, it was not difficult to separate them. The best way to obtain a series of *tridens* was to obtain ova from the females of the imagines taken, and when the larvæ emerged it was easy to tell whether they were those of the species required.

Mr. West (Greenwich) said he used to obtain the larvæ of *A. tridens* from Whitethorn round Lewisham and Lee.

NOVEMBER 22nd, 1888.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Messrs. W. G. Dawson, F. E. Brown, A. Marshall, and J. Katz were elected members.

Mr. J. Jäger exhibited *Agrotis præcox*, L., from Glamorgan-shire, obtained by shaking the sand crests; also two specimens of *Acidalia marginepunctata*, Göze., taken at Sanders-foot, S. Wales, at light, these examples were of a dark slatey colour, with indistinct markings. Mr. Carrington said the Liverpool collectors obtained a form of this species from the Isle of Man which was even blacker than those taken by Mr. Jäger; it was interesting that this form should have been obtained from S. Wales, the geological formation being altogether different from that of the Isle of Man.

Mr. Nevinson exhibited *Leucania putrescens*, Hb., from S. Wales, and two specimens of *Heliothis peltigera*, Schiff., imagines of the former were taken on the 15th, and larvæ of the other on the 18th August, the imagines emerging on the 17th September.

Mr. R. Adkin exhibited *Pieris napi*, L., from West Ireland, approaching var. *bryoniæ*, Och., *Lycæna icarus*, Rott., *Ellopiæ prosapiaria*, L., from English and Irish localities, *Ematurga atomaria*, L., *Larentia didymata*, L., *Eupithecia nanata*, Hb., and *Hypsipetes sordidata*, Fb., from English, Irish, and Scotch localities, and remarked that with the exception of the form of *P. napi* approaching *bryoniæ* they were alike from all localities.

Mr. Tugwell exhibited two specimens of *Margarodes unionalis*, Hb., from Kingsdown, Kent, 1877, off flowers of *Eupa-*

torium cannabinum, L., also two specimens of *Mecyna polygonalis*, Hb., one taken on the sandhills at Deal, and the other at Kingsdown, Kent, in 1877, off the flowers of *Funcus obtusiflorus*, Ehrh.

Mr. Hawes exhibited ova of *Bombyx neustria*, L., clustered round the stalk of a pear.

DECEMBER 13th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. G. Tindall and M. Winkley were elected members.

Mr. F. Enock exhibited a number of small Hymenopterous insects belonging to the *Chalcididæ*, which Mr. Enock stated were sent to him by Mr. Macer, who found them on the outside of sacks of Russian Wheat. He paid a visit to the Flour Mills, and found the insect swarming in thousands on the sacks and about the huge heap of grain—a sample of which he took home and examined carefully, and found several empty grains having a small puncture about $\frac{1}{32}$ inch in diameter, from which no doubt the fly had emerged. He compared it with the parasites which he had bred from puparia of the Hessian fly, and found it to be very closely allied to the Russian *Merisus intermedius* of Dr. Lindeman, to whom he had sent living specimens for identification. He was inclined to think it was parasitic upon the Granary Weevil (*Calandra granaria*, L.), specimens of which he found among the grain.

Mr. R. Adkin, on behalf of Mr. J. W. Austin, exhibited the following varieties: *Epinephele ianira*, L., ♂ of a pale shining fawn colour, *Cænonympha pamphilus*, L., strongly marked, measuring $1\frac{1}{32}$ inches in expanse, *Lycæna bellargus*, Rott., ♂ U-S., ground dark grey, usual spots absent, and *Bryophila perla*, Fb., pale, zanthic, and slatey-grey forms; taken at Folkestone.

Mr. J. T. Williams exhibited *Cymatophora or*, Fb., from the Hebrides; the specimens varied from the southern type in the dull yellow colour of the stigmata.

Mr. R. South exhibited British and foreign examples of *Dianthœciæ* allied to *D. nana*, Rott., and read the following notes: Of the three species of *Dianthœcia* more or less closely allied to *D. nana*, viz., *compta*, *albimacula* and *cæsia*; *compta* is

the only one at the present time whose right to a place in our lists is not beyond question. I think if its pretensions could be upheld or overthrown by vote *D. compta* would most certainly be scratched. It should, however, be remembered that the first admission of *D. albinacula* and *D. cæsia* to our lists was in each case on even more slender evidence than that which can be produced to support the claim of *compta*.

From 1816 to 1864 *albinacula* was enumerated among British *Dianthœciæ* on the strength of a single example in Mr. Stephen's collection which was said to have been taken at Birch Wood in Kent. On June 8th, 1864, Mr. G. H. Lacy took the second British *albinacula*; at the present moment, thanks to our Folkestone collectors, probably few collections are minus a British type at least of this species.

Although a specimen, supposed to be of Yorkshire origin, existed in the collection of Mr. G. Shepherd prior to 1866. *D. cæsia* does not appear to have been established as a British species until that year.

Writing in the *Ent. Mo. Mag.*, iv., p. 91, under the date of August 14th, 1867, Mr. E. Birchall says that his friend, Warren Wright, of Dublin, bred *cæsia* from larvæ taken on the south coast of Ireland. Since that time the species has found its way into most of our collections.

With regard to *D. compta* Mr. Birchall remarks in his list of the Lepidoptera of Ireland published in the *Ent. Mo. Mag.* for 1866, "A pair of this well-known species taken in Ireland by Mr. Tardy, are in the collection of Trinity College; but I am unable to indicate the exact locality of their capture. The insect has long been a reputed British species, and I confidently anticipate its admission to our lists when Dublin collectors bestir themselves a little."

A few years after this, Mr. Meek records the capture of several (six, I think) specimens on the Hill of Howth, Dublin, and I am afraid that this is all the evidence we have to prove *D. compta* being a British insect.

On the other side there are the published opinions of Mr. Charles Stewart Gregson and Mr. Doubleday. Both of these gentlemen appear to have been equally dubious of British *compta*, and were quite in accord in suggesting that probably the insects in question (which by the way neither of them had

then seen, I think) were *compta*-like forms of *D. nana*. Further, both were convinced that if the specimens recorded as British were really *compta*, then the said specimens were undoubtedly Continental and not British examples. In the teeth of this there are people who believe in British *compta*, and I am one of them.

In Central and Southern Europe *D. compta* is commoner and more generally distributed than *D. nana*; but the latter has a far more northern range where it becomes melanic. In the most northern and some of the eastern localities in which *D. compta* occurs, it also has a melanic form. Throughout the common area of the insect's distribution, forms of *nana* are hardly, if at all, separable from *compta*, and dark forms of the latter from melanic forms of *nana*. The larva of *compta* is said to be different from that of *nana*. It feeds on pinks and also on *Silene*. In nature the larva of *nana* has only been found on *Silene*; but it will also eat the unripe seeds not only of pinks but also of sweetwilliams in confinement, as I have had frequent opportunities of proving. If my memory serves me, the larva of *nana*, when feeding on sweetwilliam or pink, is somewhat different in appearance than when feeding on *Silene*. As the pale forms of *nana* are connected by intermediates with the melanic forms, so also are they with *compta*; and I am inclined to think that both *compta* and *nana* are forms of a primordial species represented in the present day by the melanic specimens of *nana*.

The larva of *nana* has continued attached to *Silene*, whilst the larva of *compta* has seized on *Dianthus*, hence probably the difference in colour and marking of the two larvæ. It may be mentioned that plants of the tribe *Silene* have a more northern distribution than plants of the *Dianthus* tribe: both genera belong to Caryophyllæ.

In conclusion I must briefly refer to the variation of *D. nana*. Taking Stainton's description we have for the type an insect whose primaries are "dark grey, with pure white markings; the orbicular stigma and a blotch below it white; the reniform stigma pale grey; the lines whitish, margined with dark grey; a whitish dash along the inner margin." From this type there is aberration in two very opposite directions. On the one hand, the dark grey gradually gives way in favour

of the white, to what extent I am not prepared to say; but I have seen specimens in which there was less of the dark grey colour than in the palest example in my series now exhibited, and I think it is quite possible that I may yet see a much nearer approach to albinism in this species. On the other hand, we find the dark grey increasing at the expense of the white, and also becoming heavier in tone, until at last we have a melanic form. Sometimes the primaries have a leaden grey coloration, with a more or less complete obliteration of the paler markings which in the specimens from Shetland and Lewis are often tinged with ochreous. These are the chief phases of variation; there are some other departures from the normal coloration and ornamentation, but these are somewhat erratic, and although not unimportant may be passed now without more particular reference. There are probably several specimens in my series of *D. nana* which represent varieties already named or to be named in the near future; but these I heed not. The series in its entirety fairly well illustrates the aberration to which the species is subject, and to which I have roughly adverted. The first and last examples of the series I regard as coming within touch of the extreme limits which bound the legitimate variation of the species.

I may add that it appears to me to be useless to give names to three or four of the more aberrant forms of a polymorphic species, and to ignore the lesser deviations from the type. When we confer distinctive names on other than purely local forms or dimorphic forms of a species we are either going too far or not far enough.

In the discussion which ensued Mr. South said that he considered *D. capsophila*, Dup. was only a local form of *D. carpophaga*, Bork. Some specimens of a *Dianthæcia* from South Wales were intermediate between *capsophila* and the darker form of *carpophaga*.

Mr. R. Adkin exhibited a series of *Dianthæcia nana*, from Kent, Surrey, Shetland, and the Hebrides.

Mr. T. W. Hall, series of many species of *Dianthæcia*.

Mr. Tugwell exhibited *Nemeophila plantaginis* var. *hospita*, Schiff., from Forfarshire, and some almost black specimens of *Agrotis simulans*, Hufn., from Aberdeenshire.

Mr. Manger exhibited *Dynastes hercules*, Fab., from Montserrat, *Chalcosoma atlas*, Fab., *Megalosoma thesus*, Fab., and a species of *Golofa*, which was not identified, from Brazil.

Mr. T. R. Billups exhibited specimens of *Curculio* (*Miarus*) *micros*, Germ., taken by his friend, Mr. W. West, in Headley Lane, in the year 1884, at which time Mr. West said it seemed to be in abundance; but although he had several times since diligently searched the same locality he had been unable to again meet with it.

Mr. Billups also exhibited some 50 species of Chrysomelidæ from different parts of the world, and made the following remarks:—"The magnificent family of *Chrysomelides*, or Leaf-beetles is well deserving of its name, which signifies 'golden apples,' and is given to the insects on account of their rounded and brilliantly polished bodies, which are often decorated with metallic colourings of every combination. The largest of our own British species is the well-known 'Bloody-nose Beetle' (*Timarchia lævigata*, L.), whose indigo globular bodies are familiar to most residents in the country. The genus *Chrysomela* has a very wide geographical range, and indeed wherever the climate permits insects to live at all, some of the species may generally be found. They feed, both in the larval and adult stages, on leaves, some of the larvæ being leaf-miners. It is estimated that there are from 8,000 to 10,000 species comprised in this family.

Mr. Billups also exhibited a specimen of the Homopteron, *Hotinus clavatus*, Westw., and said this very singular and grotesque insect belonged to the family Fulgoridæ, Leach (Lantern flies), and was taken by Mr. Elwes at Darjeeling, in 1886.

With reference to *Pinnotheres pisum*, the minute mussel crab, of which Mr. Billups exhibited male and female examples, Mr. Carrington said this crab was sometimes called the Pea Crab, and in his opinion was not nearly so rare as generally supposed. When he was working at the Crustacea he kept several of them in confinement, and he was certain that the crab did not feed on the mussel; it was one of those cases in which the one animal lived on the crumbs which fell from the table of the other; the crab was more a vegetable than an animal feeder, and fed on the small pieces of vegetable matter

that passed through the mussel during the process of breathing. As to the statement that the mussels let the crabs in and out of their shells, he had never seen this in those he had kept under observation, nor did he believe that they did so.

DECEMBER 27th, 1888.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. F. E. Fenton, M.R.C.P., F. P. Perks, J. Scudder, and W. Reid were elected members.

Mr. R. Adkin exhibited *Pygæra anachoreta*, Fabr., and made the following remarks: "In the *Young Naturalist*, viii., 215, Mr. C. S. Gregson, in an article upon the nativity of this species says, 'There is a mealy whiteness about foreign *anachoreta*.' The series exhibited were bred from a batch of ova received from Mr. G. P. Shearwood, but beyond that he could not give their pedigree; he, however, pointed out that the specimens varied considerably in tint; some being quite pale and agreeing with Mr. Gregson's description, while others were of a rich brownish shade. He, therefore, concluded that the tone of colour of the insect could not be relied upon as a guide to its nationality."

Mr. T. R. Billups read a paper on "Ichneumonidæ bred during the years 1887 and 1888, by members of the Society." This paper was illustrated by the exhibition of examples of the 80 species referred to, with the addition, in many instances, of the cocoon, and in some cases of the larval host.

NOTES ON THE GEODEPHAGA OF IRELAND.

By REV. W. F. JOHNSON. *Read Feb. 23rd, 1888.*

The number of species of Geodephaga at present known to occur in Ireland is only some 140, out of the 300 and odd species in the British list. This apparent disproportion of numbers arises from the fact that Ireland has never been properly worked for Coleoptera. Consequently we may reasonably suppose that a more thorough investigation would raise the number on the present list very considerably. That such an undertaking would be amply rewarded may be gathered from the fact that I have, single handed, taken in this district since I began to work at the Coleoptera (now just four years ago), upwards of seventy-six species of Geodephaga, many of which had not been previously recorded as Irish.

Of *Cicindela* we have only one representative, viz., *campestris*. I have not met with it; but have been informed that it occurs at Churchill, about ten miles distant.

Carabus is tolerably well represented, but only two appear really common, *granulatus* and *nemoralis*. Of *Elaphrus*, only the two common species *riparius* and *cupreus* have as yet been recorded. I do not know whether their power of stridulation has been noticed. My attention was drawn to it by a specimen of *E. cupreus*, which, while in my hand, to my great surprise, began to stridulate. On picking up others, I found they had the same power. The noise appeared to me to be made with the elytra.

Blethisa multipunctata has been recorded from near Belfast by Mr. Haliday, and from Lowry's Lough by myself. It occurs at the latter locality, along with *Pelophila borealis*, but is not at all as plentiful as its companion. *Pelophila* I have taken in great numbers on the shores of lakes, or loughs, as we call them. It seems to prefer a clay shore with stones upon it. The beetle is usually found under the stones, except in the height of the season, when it runs about with great activity on the mud, sand, etc., or flies in the hot sunshine. June and July are the months in which it is most plentiful; but I have taken it as late as

October. The larva I conjecture to be aquatic ; but this is a point which I have not yet been able to elucidate.

The *Dyschirii* are represented by six species ; of these *obscurus* rests on Haliday's record of its capture at Lough Neagh, and Canon Fowler seems disinclined to keep it on the British list unless further examples occur. I do not, however, think that anyone has searched the same part of the shores of Lough Neagh as Mr. Haliday since his time ; therefore, the beetle may be there waiting patiently for some enterprising coleopterist to unearth it.

The *Bembidia* on the Irish list number twenty-four. Fifteen of these have occurred here, among them being *5-striatum*, *mannerheimi*, *clarkii*, *flammulatum* and *affine*. The two last-mentioned do not appear to have been recorded elsewhere in Ireland. It is probable that additions will be made to the list of this family, as the country seems very favourable to it.

Patrobis excavatus is recorded from County Donegal and from Rostrevor Mountain in County Down ; *Pagonus chalcus* from County Dublin. One specimen of *Trechus lapidosus* was taken at Holywood, near Belfast, by Mr. Haliday, and another from Killiney beach, County Dublin, is given in Professor McNab's Dublin list.

Pterostichus musters fourteen Irish representatives. I do not get any of them in numbers except *P. diligens* and *P. strenuus*.

Amara communis bears out its name in being very common ; but the other species are decidedly sparing in their occurrence hitherto, as far as my acquaintance with them goes ; very likely, however, this state of affairs may be altered by further search.

Calathus cisteloides, *C. flavipes*, *C. mollis* and *C. melanocephalus*, are widely distributed and common, especially the last. *C. micropterus* is recorded from Donegal, and I have taken it on the coast of Antrim.

Out of the eleven *Anchomeni* on the Irish list, ten have occurred here, the missing one being *A. junceus*, which is recorded by the late Mr. R. Patterson, from the vicinity of Belfast. Of those taken here, *dorsalis*, *fuliginosus*, *albipes*, *marginatus*, and *parumpunctatus* are quite common ; the

first two being found under stones and in moss, the others on the banks of streams and lakes. I got quite a nest of *oblongus* under a heap of stones this week; it also occurs in moss, as does *gracilis*. The *Dromii* do not seem to be very plentiful in this country. *D. agilis* and *D. nigriventris* are recorded only from Dublin; the others have been taken here, near Belfast and Dublin, and consequently seem to be widely distributed. I do not, however, meet with them commonly.

Chlœnius vestitus and *C. nigricornis* were captured by me here for the first time last summer. Canon Fowler states that Mr. S. Stevens took seven specimens of *C. holosericeus* on the banks of Lough Derg, near Killaloe, in the County Clare, in 1870 or 1871. A visit to the same place would very likely result in the capture of more specimens.

The Harpalus family are very badly represented in Ireland so far. I have only taken the commonest species, and the best capture among them appears to be *H. punctulatus*, taken near Dublin by the late Dr. Power.

I have appended a list of the Irish Geodephaga as far as at present recorded. I cannot say I regard it with anything like satisfaction. It is just a beginning, and serves to show where the gaps are, and what remains to be done. I feel, however, quite sure that were the south and west, the sea coasts and the mountains of Ireland, searched by earnest workers, not only would most of the gaps in our present list be filled up, but very probably new species be added to the coleoptera of the British Isles.

LIST OF IRISH GEODEPHAGA.

Cicindela campestris, L., *Cychrus rostratus*, L., *Carabus auratus*, L., *nitens*, L., *clathratus*, L., *granulatus*, L., *monilis*, F., *arvensis*, F., *catenulatus*, Scop., *nemoralis*, Mull., *violaceus*, L., *Calosoma inquisitor*, L., *Elaphrus riparius*, L., *cupreus*, Duft., *Blethisa multipunctata*, L., *Loricera pilicornis*, F., *Notiophilus aquaticus*, L., *palustris*, Duft., *biguttatus*, F., *Leistus spinibarbis*, F., *montanus*, Steph., *fulvibarbis*, Dj., *rufescens*, F., *Nebria complanata*, L., *brevicollis*, F., *gyllenhalii*, Sch., *Pelophila borealis*, Pk., *Dyschirius thoracicus*, Ross, *politus*, Dj., *salinus*, Schaum., *globosus*, Hbst., *Clivina fossor*, L., *Tachypus flavipes*, L., *Bembidium 5-striatum*, Gyll., *rufescens*, Guer., *obtusum*, Sturm., *œneum*, Germ., *guttula*, F., *mannheimeri*, Sahl., *clarkii*, Daws., *doris*,

Pz., *minimum*, F., *lampros*, Hbst., *bipunctatum*, L., *decorum*, Pz., *affine*, Steph., *tibiale*, Duft., *atrocæruleum*, Steph., *saxatile*, Gyll., *femoratum*, Sturm., *bruxellense*, Wesm., *concinnum*, Steph., *littorale*, Ol., *pallidipenne*, Ill., *flammulatum*, Clair., *varium*, Ol., *punctulatum*, Drap., *paludosum*, Pz., *Patrobus excavatus*, Pk., *Pogonus chalceus*, Marsh., *Trechus lapidosus*, Daws., *rubens*, F., *minutus*, F., *obtusius*, Er., *Aëpus marinus*, Strom., *Pterostichus cupreus*, L., *versicolor*, Sturm., *vernalis*, Pz., *aterrimus*, Pk., *niger*, Schal., *vulgaris*, L., *nigrita*, F., *gracilis*, Dj., *minor*, Gyll., *strenuus*, Pz., *diligens*, Sturm., *vitreus*, Dj., *madidus*, F., *striola*, F., *Platyderus ruficollis*, Marsh., *Stomis pumicatus*, Pz., *Amara fulva*, De G., *consularis*, Duft., *spinipes*, L., *convexiuscula*, Marsh., *rufocincta*, Sahl., *tibialis*, Pk., *familiaris*, Duft., *acuminata*, Pk., *trivialis*, Gyll., *communis*, Pz., *ovata*, F., *similata*, Gyll., *plebeia*, Gyll., *Badister bipustulatus*, F., *sodalis*, Duft., *Sphodrus leucophthalmus*, L., *Pristonychus subcyaneus*, Ill., *Calathus cisteloides*, Pz., *flavipes*, Fource., *mollis*, Marsh., *melanocephalus*, L., *micropterus*, Duft., *Taphria nivalis*, Pz., *Anchomenus junceus*, Scop., *dorsalis*, Daws., *albipes*, F., *oblongus*, F., *marginatus*, L., *parumpunctatus*, F., *viduus*, Pz., *micans*, Nic., *piceus*, L., *gracilis*, Gyll., *fuliginosus*, Pz., *Olisthopus rotundatus*, Pk., *Dromius linearis*, Ol., *meridionalis*, Dj., *agilis*, F., *quadrinaculatus*, L., *nigri-ventris*, Th., *melanocephalus*, Dj., *Metabletus truncatellus*, L., *foveola*, Gyll., *Cymindis vaporariorum*, L., *Brachinus crepitans*, L., *Broscus cephalotes*, L., *Chlœnius vestitus*, Pk., *nigricornis*, F., *holosericeus*, F., *Harpalus punctatulus*, Duft., *puncticollis*, Pk., *rufibarbis*, F., *ruficornis*, F., *ignavus*, Duft., *latus*, L., *Bradycellus cognatus*, Gyll., *verbasci*, Duft., *collaris*, Pk., *Dichirotrichus pubescens*, Pk., *Anisodactylus binotatus*, F.



BRITISH LAND AND FRESHWATER SHELLS.

Read May 24th, 1888, by MR. F. G. FENN.

I have thought it advisable in preparing this paper on our British Land and Freshwater Shells to abandon my first idea of treating the whole group, and to give, instead, a short account of those species that are found within the South Eastern Counties. The Society's district is too well-known to require defining, and the map which I have brought is not to show its extent, but merely how it may be divided into several natural divisions, each characterised by the presence or prevalence of distinct shells.

That the South Eastern Counties are rich in mollusca will be seen from the fact that of the 136 species on our British

list, 123 are found here, though this may be partly accounted for by remembering that with the exception perhaps of some parts of Yorkshire and Lancashire, no part of England has been so thoroughly investigated.

The first thing that strikes one in recording the mollusca for any given area, is the extremely limited range of certain species when, as far as we can judge, there is no visible cause for the limitation, though certain well-known facts will account for a good deal; as, for example, the nature of the soil, whether calcareous, clay, or sand, and consequent on this the prevalence of certain food-plants. Yet when all these are taken into consideration, there still remains very much to be explained.

There are several questions which come up in writing a paper of this kind which are very difficult to answer: as, why certain species which were common in one year afterwards gradually became rarer, till they either died away altogether, or after a lapse of a year or two suddenly reappeared in profusion; and why others, as, for example, *Clausilia biplicata* at Putney, should only be found in a space almost to be measured in square yards; while another closely allied species is common throughout the whole of England. But this is not to be a paper on the problems of distribution, extremely interesting though they are.

Before going into any details, and assuming that some of those present are not very familiar with the subject, I will go rapidly through the genera with which we have to deal to-night. Beginning with the Freshwater Shells, out of 46 species only three are absent. First among the bivalves is *Sphærium*, which includes four species, three of which are found in the district; the other *Sph. ovale*, Fer., is known only from a few places in the north of England. I have one specimen from the Grand Junction Canal, but have never heard of any being found there lately. *Pisidium*, five species distributed throughout; but they are very small shells, lamentably deficient in constant characteristics, and merge so into one another by insensible gradations that very few people can accurately determine them. *Unio*, comprising three species, one absent, *U. margaritifer*, L., the pearl-bearing mussel, which is only found in rapid streams in the mountainous districts of the north of England, Wales, Ireland and Scotland.

Dreissena, one species, *D. polymorpha*, Pall. This shell attaches itself firmly to the stones or woodwork on which it lives, by means of a byssus, in exactly the same way as *Mytilus edulis*, L., the common mussel of the seashore. There is a theory that it is not an indigenous species, but was introduced by timber ships from the Baltic ; but it is more reasonable to suppose that it has become distributed by natural means, as it is common throughout the whole of the north of Europe, including Russia. It is fairly common throughout the district in running water and ponds, and in London has even made its way from the New River, and been found in profusion in iron waterpipes taken up in Oxford Street. *Neritina* ; *N. fluviatilis*, L., the only species, is of frequent occurrence, and is found commonly throughout the Thames as far as Hammersmith and Barnes ; also in the Sussex Ouse, and in the Avon at Christchurch. *Paludina*, two species, one *P. vivipara*, L., common throughout ; the other, *P. contecta*, Millet., rarely met with. The first named is the shell so often seen for sale, to put in aquaria with gold fish. *Bythinia*, two species, both common. *Valvata*, two species, both very common. *Planorbis* : of the twelve species in this genus, only one is absent, *Pl. dilatatus*, Gould. This shell occurs in a few places in Lancashire, and is generally considered an introduced species imported to Manchester in bales of cotton. *Physa*, two species, *P. fontinalis* L., and *P. hypnorum*, L., both widely distributed. There is a third, *Physa acuta*, but its only claim to rank as British, is that for many years it has inhabited a tank in, I think, the Victoria Regia House at Kew. Where it originally came from is not known with certainty ; but it is a common European species, also found in the West Indies, at Cuba, St. Thomas, etc. *Limnæa* : of eight, the only one absent is *Limnæa involuta*, Thompson, a shell only found in a little mountain lake near Killarney. There are probably no shells whose outward form is so directly the result of external conditions as those of the genus *Limnæa*. I have brought a good many examples of *L. peregra*, Müll., the most variable one, to illustrate this. As a matter of fact, almost every pond has its own variety. In a pond near Tooting a sinistral variety of this shells occurs. This form is exceedingly rare. I know no other locality for it in England ;

it is perhaps the most remarkable snail found in the district. *Ancylus* is the last freshwater genus; and the two species *A. fluviatilis*, Müll. and *A. lacustris*, L., are found in streams and ponds adhering, like minute limpets to plants and stones.

Among the land mollusca there are many more gaps. Out of 90 species only 79 are so far recorded. Of the 15 slugs three are absent; the first of these, *Geomalacus maculosus*, Allman, is exclusively Irish; the next, *Arion flavus*, Müll., is a doubtful, almost a mythical species, included in the list on the authority of a specimen which there is very little doubt was merely a variety of the common *Arion ater*, L. *Limax tenellus*, Müll., north of England only, Shetland and Northumberland. Both species of *Testacella* are included among the remaining 12. *Testacella haliotideia*, Drap., the commoner of the two, is probably much more widely distributed than is generally imagined, for though conspicuous in appearance it is of a retiring nature. The greater part of its life is spent underground; but after heavy rains it may sometimes be seen in gardens, crawling over beds and paths, and its light yellow colour, even without the small shell on its tail, renders it unmistakable. Its diet consists almost exclusively of worms; and I have known it found on one or two occasions by people who, going out on wet nights to collect worms for a fishing expedition, have found *Testacella* hunting also. Its manner of eating them strikes us as being rather cruel, a slug three inches long will attack a worm perhaps considerably longer, and having swallowed as much as it conveniently can, will digest that quietly, while the remainder writhes and wriggles about outside till it is eventually drawn in. *Succinea* is the next genus after the slugs, and we have four out of five species, the one absent *S. oblonga*, Drap., being exceedingly rare. These shells vary so much that it would be possible to arrange a series showing almost perfect gradation from *S. pfeifferi*, Rossm., to *S. putris*, L., and no two conchologists would draw the dividing lines in the same places. *Vitrina*, one species. *V. pellucida*, Müll., common. *Hyalina* = *Zonites*, ten species, all represented. *Helix*, twenty-six species, four of which are absent. Of these one *H. lamellata*, Jeff., is found only in the north of England and Scotland; the second, *H. villosa*, Drap.,

is included in the British list on the strength of four probably introduced specimens found in Glamorganshire in 1873 ; while the other two, *H. revelata*, Mich., and *H. pisana*, Müll., are restricted to the south-western counties and Channel Islands. The next genus, *Bulimus*, contains four species, all represented ; though here again, one, *B. goodallii*, Müll., is an introduced species. *Pupa*, four species, one absent. *Vertigo*, eleven species, eight of which are represented, though very locally. Owing to their small size, these shells are very frequently overlooked. *Balea*, the only species, *B. perversa*, L., is fairly common. *Clausilia*, four, all occurring in the district. *Cochlicopa*, two, *C. lubrica*, Müll., common everywhere ; *C. tridens*, Pult., rather local. *Achatina*, *Carychium*, *Cyclostoma* and *Acme*, each have their own species represented. It is possible and probable that before the list is completed some of these vacancies may be filled up, but this is how it stands at the present time.

The divisions which I have marked out here are not intended to be arbitrary, or rigidly defined, but merely to show how certain districts are characterised by the presence of certain shells. For example, anyone wishing to procure specimens of the large Roman snail, *Helix pomatia*, would naturally go to the chalk downs, and would never think of wasting his time looking over heath or sandy country ; and in the same way we go to stagnant ditches or marsh-land for *Limnæa glutinosa*, Müll., running water or lakes for *Unio* ; quiet pools for the large *Anodonta* ; and muddy waters and canals for the large *Limnæas* ; while other species like *H. carthusiana*, Müll., and *Bulimus acutus*, Müll., are known never to occur more than a mile or two inland. Broadly speaking, the chalk district supports the largest and most varied molluscan fauna ; next in order comes the low-lying alluvial land ; while the poorest districts are the dry heath and sandy country or districts of woods, as Virginia Water, Bagshot, or Leith Hill. In these and similar places shells are few in number ; there is less variety, and their texture is sometimes exceedingly thin. Granite and peat are the most unfavourable to mollusca ; but we are not troubled much with either of these in our district.

Dr. Gwyn Jeffreys, who was perhaps our best authority,

states in his British Conchology, his opinion, "that mineralogical conditions have very little to do with the habitat of any of the mollusca, nor with their comparative abundance or scarcity in any locality." It seems reasonable, however, to suppose that the connection of certain species with certain formations, even though they may not be restricted to them, is not entirely attributable to accident. As an example of this, we are apt to associate *Cyclostoma elegans*, Müll., with limestone and chalky districts; but it occurs fairly commonly in Jersey, where there are no calcareous strata at all. It is generally the case that when species commonly found on chalk occur in other districts the texture of the shells is thinner; and we assume, from the form found on the chalk being far more abundant, that it is the typical one, and that the thin shell is adapting itself perforce to unnatural conditions. Snails can exist on any soil that contains some amount of calcareous matter, and I think very few soils are entirely devoid of this.

Beginning in the North West:—The first district is what we will call the Upper Thames division, which may be taken roughly as including the whole of Berkshire. The greater portion of this district is on the chalk formation. It is a very little worked district, and I have but few records. Amongst these, however, are *Paludina contecta*, Millet., which occurs in a few places; and *Limnæa glutinosa*, Müll., one of the rarest of the *Limnæas*, is found at Reading, and nowhere else in the district till we come to East Kent. When living, the shell is completely covered by the mantle, which renders it readily distinguishable from all other *Limnæas*, where the mantle only reaches to or slightly beyond the outer lip.

The Lower Thames Region.—This district includes the south side of the river from Windsor to the borders of Kent, and such part of Surrey as lies north of the chalk downs. This part of the river is essentially the home of those species which like mud and a sluggish water, as *Paludina vivipara*, L., *Limnæa auricularia*, L., *Unios*, and *Anodontas*, though these never attain any size like they do in quiet pools. *D. polymorpha*, Pall., is common in the upper parts of the river, where the water is clearer; also in adjacent streams and ponds. *Neritina fluviatilis*, L., adheres to stones through-

out, even as far down as Barnes and Putney: it seems to live contentedly either in clear running water, or in the liquid mud which does duty for water in the lower parts of the Thames. Of the remainder of this division the shells of Barnes Common are fairly typical, and here are found *Pl. lineatus*, Walker, a curious little shell which has the interior separated by plates into chambers something after the fashion of the Nautilus. Also the little *Vertigo antivertigo*, Drap., and still smaller *Vertigo pygmæa*, Drap., and even smaller than this the tiny *H. pygmæa*, Drap., the smallest of our British *Helices*. Farther down the river at Putney is found *Cl. biplicata*, Mont., now the only British locality of the species, and when built over or drained, as seems inevitable, it will probably become extinct. Close by here is found *P. roseum*, Scholtz. This shell has been recorded for Hastings by Mr. J. H. A. Jenner; but the only other locality of recent date is Minster, where it was first noticed by Mr. S. C. Cockerell.

The North Kent Region.—This is merely a narrow strip extending through Greenwich, Woolwich, Gravesend, and Chatham. The distinctions, however, which warrant this being classed as a separate division are mainly of a negative character. The larger species of *Planorbis* found along the Thames valley are mainly absent, but their place is taken by small shells of the genus *Limnæa*, *Pisidium*, *Valvata*, etc. Almost the only characteristic shell is *Hydrobia similis*, Drap., a little shell not a genuine freshwater species, but it occurs in muddy ditches and other places that are occasionally overflowed by the tide. With it is sometimes found *Assiminea grayana*, Leach, another estuarine species, though more marine in its habits than *Hydrobia*.

The North-East Kent and Thanet Division.—This district includes a strip extending from the coast line to the North Downs, and from Sheppy through Whitstable, Herne Bay, Margate, and Ramsgate, to Sandwich. It was undoubtedly once a portion of the old Thames Valley; and therefore it is not surprising to find that the fauna bears a marked resemblance to that of the present valley, and that there are very few distinct species. *Assiminea grayana*, Leach, which first appeared in the last division is here fairly common in brackish water. Perhaps the most representative shell may be con-

sidered *Limnæa glutinosa*, Müll., which occurs in two other places, and in the marshes near Reculvers is rather common. Almost without exception the shells which are found through Putney, Barnes, and Kew occur again here, as *Pl. corneus*, L., various species of *Limnæa*, *Pisidium roseum*, Scholtz., etc. It is curious that several shells in this district have white varieties, as though there were some peculiarity in the place which tended to produce albinism. As examples of this *Planorbis corneus*, L., *Limnæa palustris*, Müll., and *Physa fontinalis*, L., have each a white var. occurring in the marshes.

North Downs Division.—This division is the broad belt of chalk downs extending from East Kent away through Surrey and Hampshire, ending beyond the district with which we are now dealing on the borders of Wiltshire. As might be expected we have here a considerable change in the fauna, and we find a number of those shells which in the south of England at least are always associated with the chalk downs. In walking through Surrey or Kent no one can fail to be struck by the change in mollusca on passing from the tertiary clay or sand to the cretaceous, and it is impossible to believe, as I said before, that this can be merely attributable to accident. Among the most noticeable shells are *H. pomatia*, L., which occurs at intervals, and in a few places, as Dorking, Caterham, and Reigate, etc., is extremely common. *H. lapicida*, L., an uncommon species, and other such shells as *Helix virgata*, Da Cos., *H. ericetorum*, Müll., *H. caperata*, Mont., and *Cyclostoma elegans*, Müll., *Clausilia laminata*, Mont., and *C. rolfhii*, Gray., and *Coch. tridens*, Pult. None of these shells I think, occur anywhere in the district north of these downs. At Caterham occurs a very beautiful yellow variety of *H. aspersa*, Müll.; it is found by the side of the road feeding on *Clematis vitalba*; and white varieties of *H. rotundata*, Müll., and *Hyalina nitidulus*, Drap., I have taken at Orpington, but they are far from common.

On the Kentish coast is found one of the most rare, if not the rarest British shell, *Acme lineata*, Drap., a white variety of which has been taken at Folkestone.

Testacella is found rather commonly at Croydon and Norbury. My last authority for this is our gardener, who is very

familiar with the slug worm-eaters, and has found it when digging in our present garden.

At Preston Candover, near Basingstoke, a white variety of *Clausilia laminata*, Mont., has been found rather commonly.

Sussex District.—This division includes a small piece of the Kentish coast and the whole of the county of Sussex. It is situated mainly on two distinct formations, viz., that portion of the Wealden generally known, I think, as the Hastings sand and the southern branch of the range of chalk hills or the South Downs. The shells vary very considerably from east to west. The eastern fauna more nearly approaches that of the Thames valley or the North Kent marshes, and all the ponds and streams are well stocked with the freshwater bivalves *Sphærium*, *Pisidium*, etc., and many species of *Limnæa*, *Planorbis*, etc. *Limnæa glutinosa*, Müll., common in North Kent, is conspicuously absent here. Among the slugs *T. haliotideæ*, Drap., has been found on one or two occasions. *Zonites* and *Helix* are well represented by the commoner species. *H. carthusiana*, Müll., and *H. virgata*, Da Costa., occur round the south coast, common on the chalk, but much rarer elsewhere. Three species of *Vertigo* have been taken, *pygmæa*, Drap. *antivertigo*, Drap., *edentula*, Drap., and *Acme lineata*, Drap., near Hastings. The general character of the East Sussex shells is an abundance of the commoner species, but nothing peculiar or remarkable. The details about East Sussex I have mainly extracted from a list compiled by Mr. J. H. A. Jenner. In the western part of the county there are several fresh shells which appear to be stragglers from Hampshire. Dead shells have been found of *H. pomatia*, L.; and *H. obvoluta*, Müll., and *H. fusca*, Mont., occur sparingly. Of the last, two specimens were taken at Lewes in 1852, but I have never heard of its being taken since. *Helix sericea*, Müll., easily distinguished by the silky hairs with which the epidermis is covered, is found in one or two places. *H. ericetorum*, Müll., and *H. virgata*, Da Cos., occur all round the coast, most abundantly on the chalk.

One very curious slug found in this district is *Limax cinereo-niger*, Wolf. The upper surface does not differ noticeably in some specimens from *Limax maximus*, L., the common potted slug of our gardens; but on the under side of sole

there are two black bands about one-eighth of an inch in width, leaving a white mark down the middle, and by this it can be readily distinguished. There is only one locality for this in the South of England.

South Hants.—This, the western extent of the district, is mainly situated on clay and London clay, with, in the forest district, sand and gravel; and is the home of those species which are met with occasionally in West Sussex, as *H. obvoluta*, Müll., *H. lapicida*, L., *Limax arborum*, B.Ch., etc. It contains the only locality I know for *Hy. excavatus*, Bean., but it is also interesting as being the western limit of *T. haliotideia*, Drap., and the eastern limit of the other species *T. maugei*, Fer. The last species is found at Fareham, and the other at Winchester. *Amalia gagates*, Drap., a rather uncommon lead grey slug is found at Christchurch, but it has also been taken in Sussex, at Hastings. *Paludina contecta*, Millet., has been taken in one place. Among a number of interesting shells taken by Mr. Ashford at Christchurch are a beautiful yellow variety of *Neritina fluviatilis*, L., with the usual dark markings in some cases quite absent, and white varieties of *C. rugosa*, Drap., and *P. umbilicata*, Drap. The other shells found in this district do not differ remarkably from those common to Sussex and North Kent.

Isle of Wight.—I have very few records at all from here; but it is interesting as being the eastern limit in the range of *Bulimus acutus*, Müll., a shell which occurs along the coast line of Cornwall, Devon, and Dorset. Among its other shells are two species of *Vertigo* and *Testacella haliotideia*, Drap.

This is the last of the eight districts which I marked out, and with it I will conclude. If the paper has been uninteresting, as I am afraid it has, I will only ask that members will not imagine that the subject itself is tedious, but will lay the blame on its treatment. Certain parts have been very little searched, and any specimens, slugs or snails, would be welcome. I was cautioned before writing this against making it a mere list of names, but fear I did not keep this sufficiently in mind. All that remains for me now, however, is to thank you for the attention with which you have listened.

ICHNEUMONIDÆ BRED DURING THE YEARS
1887 AND 1888 BY MEMBERS OF THE SOUTH
LONDON ENTOMOLOGICAL AND NATURAL
HISTORY SOCIETY.

Read 27th December, 1888, by MR. T. R. BILLUPS, F.E.S.

I propose taking the species alphabetically, simply making a note of any that may be uncommon; and I should add that I am compelled to keep back for a future paper many species which, at the present moment, are undetermined.

Apanteles impurus, Nees, bred by Mr. South from *Cnæmidophorus rhododactylus*, Fb. *Apanteles fulvipes*, Hal., Mr. South reared in some numbers from *Toxocampa craccæ*, Fb. This appears to be a new host for this species. *Apanteles vimenentorum*, Wesm., was bred in some numbers by myself from the lilac leaf-miner, *Gracilaria syringella*, Fb. This is also a new host for this species. *Apanteles spurius*, Wesm., was reared by Mr. South from *Halia vauaria*, L.; by Mr. Adkin from *Arctia caia*, L.; and by myself from a cluster of cocoons found attached to a leaf of plum tree. *Apanteles xanthostigmus*, Hal., was bred by Mr. South from *Gracilaria stigmatella*, Fb.; while Mr. Elisha bred *Apanteles bicolor*, Nees, from *Lithocolletis lantanella*, Schr. *Apanteles pallidipes*, Reinh., was reared by myself from a cluster of cocoons found on a thistle growing on the railway bank, East Dulwich. *Apanteles nothus*, Reinh., was bred by Mr. Elisha from *Lithocolletis lantanella*, Schr. This species is the smallest of the family of *Apanteles*, and Mr. Elisha has found it a new host. *Apanteles congestus*, Nees, was bred by Mr. South from the larvæ of *Hadena pisi*, L.; *Apanteles tetricus*, Reinh., was also bred by Mr. South. This species has hitherto only been observed in Devonshire, Mr. South has not only succeeded in rearing it from an unknown larva feeding on *Armeria maritima*, Willd. but has found it in a new locality, The Warren, Folkestone. *Apanteles zygænarum*, Marsh. This insect is one of the Rev. T. A. Marshal's new species, and hitherto only known from five specimens being bred by Mr. Bignell from *Zygæna*

filipendulæ, L.; Mr. South has succeeded in rearing it from *Melitæa aurinia*, Rott. *Apanteles jucundus*, Marsh, another new and rare species, hitherto only determined by one specimen, a female, taken by sweeping in Northamptonshire, was bred by myself in some numbers from the larvæ of *Pieris brassicæ*, L., from Ireland, for which I am again indebted to my friend Mr. South. Mr. Sheldon was also good enough to present me with a larva of *Geometra papilionaria*, L., which produced no less than 42 specimens of *Apanteles rubripes*, Hal. *Apanteles vitripennis*, Curt., of which there are only some half dozen known specimens, was bred by myself from the larvæ of *Boarmia gemmaria*, Brahm.; but I think it is Mr. South who deserves the credit, as I fancy he was my generous donor.

Amblyteles proteus, Wesm. This fine species of Ichneumonidæ was bred by Mr. Adkin from the larvæ of *Chærocampa elpenor*, L.; Mr. Barker rearing the same species from *C. porcellus*, L. *Amblyteles fusorius*, Lin., was bred by both Messrs. Adkin and Barker from the larvæ of *Chærocampa porcellus*, L.; while one solitary specimen was bred by Mr. Adkin from *C. elpenor*, L.

Anomalon cylindricum, Bridg. To Mr. Barker is due the honour of adding 4 specimens of this rarity to the two already described by Mr. Bridgman as a new species, bred from *Euchelia jacobææ*, L., Mr. Barker's host being *Chærocampa elpenor*, L. *Anomalon clandestinum*, Gr., was reared by myself from the larvæ of *Nemoria viridata*, L. *Agrypon flaveolatum*, Gr., was bred by Mr. South from the larvæ of *Eupithecia lariciata*, Frr.

Three very fine specimens of *Banchus moniliatus*, Gr., 2 males and 1 female, were bred by Mr. Barker from *Chærocampa elpenor*, L. *Bracon variator*, Nees., was bred by Mr. Elisha from the larvæ of *Coccyx strobilella*, L., this being a new host for this somewhat rare species, which is generally supposed to have been parasitic either on some small species of Curculionidæ, or on flies of the genus Trypeta. Another scarce species has fallen to the lot of Mr. South in *Bracon osculator*, Nees., which he bred from the larvæ of *Coleophora virgaureæ*, Sta., the only hitherto recorded bred specimen being a female reared by Mr. W. H. Fletcher, from *Coleo-*

phora cæspititiella, Zell. Two fine specimens of *Banchus falcator*, Fab., were bred by Mr. Adkin from the larvæ of *Chærocampa porcellus*, L.

Colastes braconius, Hal. This very fragile gnat-like looking insect is a solitary parasite of leaf-mining Lepidoptera, and has been bred by Mr. Elisha from *Lithocolletis lautella*, Zell., and *L. tenella*, Zell.; while he has prematurely forced it from *L. bremiella*, Zell., and *L. spinicolella*, Kol. I have also reared the same species in some numbers from mined oak leaves. *Casinaria mesozosta*, Gr., was bred by Messrs. Barker and South from the larvæ of *Cucullia verbasci*, L., the latter gentleman being fortunate in also rearing two specimens of the much rarer species *Casinaria tenuiventris*, Gr., from the same host. *Casinaria vidua*, Gr., was bred in large numbers by Mr. Hall from the larvæ of *Abraxas grossulariata*, L., as also several good species of Diptera. *Cryptus titillator*, Gr., both males and females, were bred by myself, from the cocoons of the saw-fly *Trichiosoma betuleti*, Klug.; while a solitary male of *Cryptus migrator*, Fab., was bred from the larvæ of *Saturnia pavonia*, L., by Mr. Barker. *Campoplex ebeninus*, Gr., was bred by myself from the larvæ of *Dasychira fascelina*, L. *Chorinæus cristator*, Gr. Of this handsome species Mr. Adkin bred 2 males and 1 female from the larvæ of *Eupithecia coronata*, Hb.

Diospilus oleraceus, Hal., I again reared in some numbers from the earth cocoons made by the larvæ of *Ceuthorhynchus sulcicollis*, Gyll.

Exetastes osculatorius Gr., was bred by Mr. Barker from the larvæ of *Boarmia abietaria*, Hb., Mr. South rearing the same species from *Cucullia verbasci*, L. A solitary female was also bred from a cocoon found in my own garden, host unknown.

Two specimens of *Glypta ceratites*, Gr., a male and female, were bred by Mr. South from *Ephippiphora nigricostana*, Haw.; as also two males of *Glypta pedata*, Desvn., from the larvæ of *Hedya ocellana*, Fb.

A fine male *Ichneumon monostagon*, Gr., was also bred by Mr. South, who could not speak with accuracy of the host. Another of our members bred a male and female of *Ichneumon impressor*, Gr., from the larvæ of *Gortyna ochracea*, Hb.; and

a fine female of *Ichneumon haglundi*, Holmg., was bred by Mr. Adkin from *Spilosoma fuliginosa*, L.

Limneria interrupta, Gr. Two females and one male were bred by Mr. South, their host being *Sericoris euphorbiana*, Frr. ; while three specimens, all males, of *L. armillata*, Gr., were bred by Mr. Elisha from *Pempelia palumbella*, Fb. *Limneria ensator*, Gr., was bred by Mr. South and myself, having for its host *Eupithecia linariata*, Fb. The same species was also bred by Mr. Tugwell from *Boarmia repandata*, L. *Limneria geniculata*, Gr., was bred both by Messrs. South and Adkin, the former's host being *Ellopija prosapiaria*, L., and the latter *Brephos notha*, Hb. Three specimens only of *Limneria henaulti*, Gr., were bred by Mr. Hall, amongst his host of *Casinaria vidua*, Gr., from *Abraxas grossulariata*, L. Three males and two females of *Limneria uncinata*, Gr., were bred by Mr. South from the larvæ of *Aciptilia galactodactyla*, Hb., while *Limneria femoralis*, Gr., was bred from *Coleophora lineolea*, Haw., by the same gentleman ; *Limneria majalis*, Gr., was bred by myself from the larvæ of *Eupithecia coronata*, Hb. ; and a cluster of cocoons found on a pear tree in my own garden, produced fourteen females and eleven males of the exceedingly delicate little *Limneria gracilis*, Gr. Two females and one male of *Limneria crassicornis*, Gr., were bred by Mr. South from *Oxyptilus teucrii*, Greening. One female of *Lissonota segmentator*, Gr., was reared by Mr. Tugwell from the larvæ of *Sesia sphægiformis*, Fb. ; while one male of *Lissonota decimator*, Gr., was bred by Mr. J. T. Williams, but the host was doubtful.

Mesostenus obnoxus, Gr. Three females of this fine *Ichneumon* were presented to me as bred from *Eupithecia coronata*, Hb., by one of our members, but I have unfortunately mislaid the name of my generous donor. *Mesoleius sanguinicollis*, Gr., was bred by Mr. South from *Gracilaria stigmatella*, Fb. ; while two specimens of *Mesochorus fulgurans*, Hal., were bred by Mr. Hall from *Abraxas grossulariata*, L. *Mesochorus confusus*, Holmg. ; both sexes of this beautiful little *Ophion* were bred in some numbers by Mr. Adkin, from *Euchelia jacobææ*, L., as also from *Epichnopteryx radiella*, Curt., by Mr. Elisha. *Macrocentrus linearis*, Hal., were bred by Mr. Elisha in some numbers, and from different hosts :—*Aspis udmanniana*, L.,

producing all males, while no less than twenty-three females were produced from *Penthina capræana*, Hb., *Epichnopteryx radiella*, Curt., also producing two males. The same species was bred by Mr. Tugwell from *Cucullia gnaphalii*, Hb., while from a group of cocoons found attached to an aspen leaf, no less than twenty-seven specimens were reared by myself, sixteen being females and eleven males. To Mr. Cooper I am indebted for a fine female of *Macrocentrus marginator*, Nees, which he bred from the larvæ of *Sesia culiciformis*, L. *Meteorus ictericus*, Nees, was bred by Mr. South from *Botys asinalis*, Hb. To the same gentleman my thanks are due for two females of the rare *Meteorus luridus*, Ruthe., but Mr. South does not know the host. This is to be regretted, especially as there are only two records of its having been bred before; a solitary female was bred from *Eupithecia venosata*, Fb., by J. W. Cross, at Ely, and Mrs. Hutchinson sent Mr. Bignell twenty-three specimens of both sexes, bred from one larva of *Noctua brunnea*, Fb. With *Meteorus pulchricornis*, Wesm., Mr. South was more fortunate, rearing four males and three females from *Eupithecia virgaureata*, Dbl. To Mr. Barker falls the honour of breeding two males of *Microplitis spectabilis*, Hal., but he is not certain of the host, most probably *Dianthæcia carpophaga*, Bork. *Meniscus agnatus*, Gr., was represented by one female, bred by Mr. Wellman, from the larvæ of *Sesia tipuliformis*, Clerck. *Microgaster flavipes*, Hal., was bred in large numbers both by Mr. South and myself from the larvæ of *Boarmia repandata*, L. *Microgaster minutus*, Reinh., and the more common Bracon *Microgaster alvearius*, Fab., were bred in considerable numbers by myself, the former having as its host *Cleora glabraria*, Hb., and the latter species *Boarmia gemmaria*, Brahm. Mr. South bred large numbers of *Microgaster subcompletus*, Nees., from the larvæ of *Tortrix viridana*, L. From the larvæ of *Porthesia similis*, Fues. *Microgaster connexus*, Nees., was bred by myself, most of the specimens being females, while Mr. South bred two males of *Microgaster calceatus*, Hal., but was doubtful of the host, it probably being *Lobophora carpinata*, Bork.

Two fine males of *Nemeritis macrocentra*, Gr., were bred by Mr. Adkin from the larvæ of *Retina pinicolana*, Dbl.; while

from *Pygæra pigra*, Hufn., Mr. Barker bred males and one female of *Ophion obscurum*, Fab.

Phygadenon titillator, Gr., was bred from the larva of *Bombyx quercus*, L., by Mr. Tugwell. *Pimpla nucum*, Ratzb., was bred by Mr. Elisha from two hosts, i.e., *Trifurcula immundella*, Zell., and *Lithocolletis cavella*, Zell., the rare little *Pimpla brevicornis*, Gr., was bred by Mr. South from *Gracilaria stigmatella*, Fb. Two males of *Pimpla instigator*, Fab., were bred by myself from the larvæ of *Emmelesia minorata*, Tr. A very curious *Psyche* case found on a railway fence at Peckham by myself, produced *Pezomachus analis*, Foerst.; while from another I found on a wall at Weybridge, I bred *Pezomachus costalis*, M. From the larvæ of *Chærocampa porcellus*, L., Mr. Adkin bred three males and two females of *Probolus alticola*, Gr. Mr. Barker adding two more females from the same host.

From the cabbage galls of *Ceuthorrhinchus sulcicollis*, several specimens of both sexes of *Sigalphus obscurellus*, Nees., were bred by myself.

To Mr. Adkin, however, belongs the honour of producing the largest specimen of Ichneumonidæ i.e., *Trogus lutorius*, Fab., from *Chærocampa porcellus*, L., and *Trogus alboguttatus*, Gr., from *Sphinx ligustri*, L. Mr. Cooper heads our list by breeding from *Sesia sphegiformis*, Fb., *Chasmodon notatorius*, Fab., the very first species on our list of British Ichneumonidæ.

When we take into consideration the different species that have been sent away to specialists, to say nothing of those which have been destroyed, it is probable that not more than a tithe of the species actually bred by our members during the past two years are enumerated in the present list. If some nine or ten gentlemen can get together some 100 species of these insects, what might we not expect in a Society numbering some two hundred members, and mostly Lepidopterists, if we could but prevail upon them to preserve in future any parasite they may happen to breed, with the name at least of the host from which such parasite was bred. Very many new species would most probably be added to the British list of Ichneumonidæ, and a vast amount of knowledge gained, with reference to the habits and curious

relations that exist between these parasites and their respective hosts. Should the reading of these notes induce other of our members to turn their attention to these interesting creatures I shall indeed feel that my time has been well spent in compiling this short list.

REPORT, 1889.

IN the year that has passed, being the eighteenth in the Society's history, the Council can again report that the Society continues to prosper and increase rapidly in membership; although in this year only forty-four members have been elected as against an average of fifty for the previous three years. At the commencement of the year there was a membership of exactly 200, to which forty-four members have since been added; on the other side, there has been a falling-off of twenty-one members, made up as follows: by death one, by resignation ten, and ten others have been struck off the books. This leaves a total membership of 223, consisting of 6 honorary, 3 life, 167 ordinary, and 47 country members.

The financial position continues good; but it is much to be regretted that the Treasurer has to carry over such a large amount of unpaid subscriptions, and the Council earnestly hope that members who are in arrear will at once discharge their liability to the Society.

The following is a list of the donations and additions to the Library during the year:—

“The Entomologist” for 1889 and “The Zoologist” for 1889, from Mr. T. P. NEWMAN.

“The Entomologist's Monthly Magazine” for 1889, from Mr. McLACHLAN.

“The Young Naturalist” for 1889, from Mr. J. E. ROBSON.

“The Selborne Magazine” for January and February, from the PUBLISHER.

“The West American Scientist,” “Canadian Naturalist,” and “Bulletin of the Torrey Botanical Club,” from Mr. T. D. A. COCKERELL.

“The Garner” for 1889, from Mr. T. R. BILLUPS.

‘ Withering’s Botany,” from Mr. E. STEP.

“ Montague’s Dictionary of British Birds,” from Mr. CAR-
RINGTON.

“ The Essex Naturalist ” for 1889, from the ESSEX FIELD
CLUB.

“ The Naturalist’s Gazette ” for March, from Mr. H. BATH.
Darwin’s “ Naturalist’s Voyage Round the World,” from
Mr. WHITE.

Shuckard’s “ Bees,” from Mr. W. H. McLACHLAN.

Report of the Maidenhead Naturalists’ Field Club, from
Mr. FARR.

Loudon’s “ Trees and Shrubs,” from Mr. F. N. WARNE.

“ Incidental Observations on Pedigree Moth Breeding,”
from the Author, Mr. MERRIFIELD.

“ The Entomologist’s Annual ” for 1870, from Mr. BOLGER.

“ List of the Flowering Plants round Maidstone,” from the
Author, Mr. H. LAMB.

“ Report of the West Kent Natural History Society ” for
1888-9, from the Society.

“ Variation and Darwin,” from the Author, Mr. R. W.
BOWERS.

“ Dulwich College Science Society’s Report,” 1888-9, from
the SOCIETY.

“ Handbook of European Butterflies,” from the Author,
Mr. W. F. de V. KANE.

“ Proceedings of the Hampshire Field Club,” from Mr.
KELSALL.

“ Notes on the Varieties of *Arctia mendica*,” with Plate,
from the Author, Mr. PORRITT.

“ The Senses of Animals,” from the Author, Sir JOHN
LUBBOCK.

And by Purchase:—

“ Science Gossip ” for 1889, and “ Year Book of Scientific
Societies.”

In January the sum of £5 5s., paid for a life membership,

was transferred to the Library Fund, and a larger book-case was secured ; the balance of the £5 5s., with an additional £10, subsequently voted to the same fund, was expended by the Library Committee, Messrs. J. T. CARRINGTON, E. STEP, C. A. BRIGGS, and D. J. RICE, in the purchase of the under-mentioned works :—

Bell's "Crustacea," "Quadrupeds," and "Reptiles," Saunders' "Birds," Seeley's "Fishes," Huxley's "Crayfish," Jeffreys' "Land and Freshwater Mollusca," Staveley's "Spiders," Forbes' "Starfishes," Gosse's "Sea-Anemones," Romane's "Jelly-fish," Hooker's "Flora," Hobkirk's "Mosses," Stevenson's "Fungi," Gray's "Sea-weeds," "The Substitute," Claus and Sedgwick's "Mollusca to Man," and Gosse's "Marine Zoology."

In addition to this, many volumes of Magazines have been bound, and other books re-bound.

The Collections have been enriched by the addition of many species.

The thanks of the Council are due both to Mr. RICE and Mr. WEST, for their care and attention to the Library and Collections respectively.

During the year the following Excursions were arranged :—

25th May—The Zoological Society's Gardens.

Conducted by Mr. J. Jenner Weir.

22nd June—Horsley, Surrey.

Conducted by Mr. J. T. Carrington.

20th July—Westerham, Kent.

Conducted by Mr. J. T. Carrington.

21st September—Kew Gardens.

Conducted by Mr. T. R. Billups.

26th October—Esher (Fungus Outing).

Conducted by Mr. E. Step.

The Annual Exhibition was held on the 30th and 31st October last, the Exhibitors numbering ninety-seven. On the first evening a charge of 1s. was made for admission ; the second evening admission being as usual free by com-

plimentary ticket. Several of our country members having expressed a wish that the Exhibition should be open during the early part of the second day, it was decided to open between the hours of 2 and 4 in the afternoon. The attendance was not so large as might have been expected, but the opportunity offered by the comparatively clear state of the rooms for careful examination of the exhibits, which was freely taken advantage of by all who were present, confirms the Council in their opinion that an afternoon view was desirable. During the time the Exhibition was open it was visited by about 2,200 visitors.

The management of the "Bridge House" in June last having given the Society six months' notice to leave, the Council, through the assistance of the President, have come to an arrangement with the Company in whose rooms the Society now meet, for a yearly tenancy at an annual rental of £25. This amount is considerably in excess of that previously paid, but is fully compensated by the increased accommodation and convenience, one of the principal advantages being that the Library is now available for the use of members from 7 p.m. The Council trust therefore that members will use their influence to increase the membership, and thus enable the Council to meet the additional expenditure without in any way interfering with the other work of the Society.

H. W. BARKER,

Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

BALANCE SHEET FOR THE YEAR 1889.

GENERAL FUND.

<i>Receipts.</i>	<i>£ s. d.</i>	<i>Expenditure.</i>	<i>£ s. d.</i>
To Balance, Dec. 31, 1888	24 10 11	By Rent	12 12 0
" Subscriptions and Entrance Fees	55 12 6	" Printing	4 4 6
		" Postage and Stationery	9 4 6
		" Books and Magazines	1 10 0
		" Transfer to Library Fund	15 5 0
		" Insurance	0 7 0
		" Balance in hand	37 0 5
	<u>£80 3 5</u>		<u>£80 3 5</u>

PUBLICATION FUND.

<i>Receipts.</i>	<i>£ s. d.</i>	<i>Expenditure.</i>	<i>£ s. d.</i>
To Balance from 1888	3 15 6	By Balance in hand	4 0 6
" Sale of "Proceedings"	0 5 0		
	<u>£4 0 6</u>		<u>£4 0 6</u>

LIBRARY FUND.

<i>Receipts.</i>		<i>Expenditure.</i>	
	£ s. d.		£ s. d.
To Balance from 1888	... ..	By Book-Case	... ..
" Vote from General Fund	... ..	" Purchase of Books	... ..
" Book Fines, per Hon. Librarian	... ..	" Binding	... ..
		" Balance in hand	... ..
	<u>£18 12 0</u>		<u>£18 12 0</u>

<i>Assets.</i>		<i>Liabilities.</i>	
	£ s. d.		£ s. d.
To Cash Balance, General Fund	By Rent, due Christmas, 1889	... ..
" Publication Fund	" Deficit on Exhibition Account (Estimated).	... ..
" Library Fund....	" Balance	... ..
" Estimated Realisable Proportion of Arrears
(£23 17s.)
	<u>£49 7 10</u>		<u>£49 7 10</u>

Audited, compared with Vouchers, and found correct, *January 15th*, 1890.

THOS. W. HALL
H. HAYWARD,

} *Auditors.*

PRESIDENTIAL ADDRESS, 1889.



GENTLEMEN,

Sincere and hopeful is my salutation to you on addressing you from the chair this evening, to which I was by your kindness a second time elected last season. It has been a rule for some years past that at the Annual General Meeting the retiring President should as briefly as possible review the work and progress of the Society for the past year. In observing this custom I take the opportunity of returning you my heartiest thanks for the general goodwill and kind forbearance shown me while I have held this office.

We are frequently asked, Is the Society prospering and doing all it was intended to do by its founders? I think, gentlemen, it is matter for congratulation that the Society still continues to increase in numbers, and that it is now far and away above anything that could have been anticipated by the original founders. We have heard from our Hon. Secretary a very favourable report, especially as regards the membership. Although we have lost one member by death and have had several resignations, and I regret to add, several struck off the list, still, with all these drawbacks, your membership is now very much larger than at any previous time in the Society's history, the roll of members numbering 223. I was sanguine enough in my last address to hope that we should add another fifty to our number during the year we were then entering upon; that desirable result was not quite achieved, the number of members elected being forty-two. This, I think, is a very welcome and encouraging sign that the popularity of the South London Entomological Society is not on the wane, but is still as great as ever.

I am sorry to say that the financial condition of the Society still causes our Chancellor of the Exchequer some very anxious

moments. Mr. Step reports that a very large number of subscriptions are still unpaid, and that he is almost weary of making his appeals to the defaulting members, and unless there is soon a marked improvement the Council will be obliged to adopt some drastic measure to remedy this unsatisfactory state of affairs. If the Society is to continue in a healthy and vigorous condition an effort must be made on the part of members to obtain more prompt and regular payment; and this is now more especially urgent as we have become located in new quarters at a greatly increased rental. For some considerable time past we have been inconvenienced through not being able to hold our meetings in the rooms we originally engaged at the Bridge House Hotel, so that our Council was compelled to make serious complaint to the proprietor. That gentleman, not seeing his way clear to give us the necessary accommodation, gave us six months' notice to leave, thereby entailing upon our Council the troublesome duty of once more finding us a new and commodious habitat. After a somewhat lengthy and anxious search we were enabled to make arrangements for the occupation of the present suite of rooms, but, as I have previously stated, at a very much higher rental—in fact, just double the amount previously paid.

And now comes again the question my predecessor, Mr. Adkin, put in his last address—Will the change prove advantageous to the Society? Our Council have every reason to believe that it will, we having accommodation far superior to anything previously enjoyed by the Society. Our Library will be at the members' service much earlier than has been hitherto possible, as our Council-room will now be quite apart from it, thus obviating the necessity of keeping the members who have half an hour to spare waiting outside the room while the Council deliberates. Then our ordinary Meeting Room is larger and much better ventilated, so we hope that during the summer evenings we shall not hear so many complaints of the excessive heat. The lighting is perhaps not quite all we could wish, but I think our Council are in the position to promise that before long there will be no cause for complaint upon that point. It now only remains for you, as members, to relieve our Treasurer's anxiety as to

whether we shall be enabled to continue in our present quarters, or whether we shall be cast adrift through the apathy of members in not supplying him with the one thing that is needful to keep us in possession of these commodious and convenient quarters.

The Library, under the fostering care of Mr. Rice, has been largely increased and much enriched by many valuable works, acquired by presentation, to the donors of which we feel it our duty to return our very grateful thanks. In addition to these gifts, the Council voted £15 for the purchase of books; this sum our Library Committee seem to have expended very judiciously, not only in acquiring a considerable number of works, but several of great rarity. To members who may have extensive libraries or duplicate copies of any Biological works to spare, I cannot suggest a more useful and beneficial mode of disposing of their surplus stock than by presenting them to Mr. Rice, for the Library. He will, I feel sure, be delighted to be enabled to add to the Society's valuable store of literature, however small the work may be.

The Society's Collections under the charge of our indefatigable Curator Mr. West, still continue to grow; but not as rapidly as Mr. West could wish, and indeed might reasonably expect, considering the large number of members who are interested in the different orders. I am informed that there are many vacant spaces in the cabinet waiting for types of even the commoner forms of lepidoptera. I feel sure this is not from want of generosity on the part of our members, but from the fact that they are not apprised from time to time that there is a typical collection in the Society's possession for the use of beginners. I hope our friends will bear this matter in mind, and that soon we shall hear that there is no more room in the old cabinet, and that a new one will be required for types of the new species that may be discovered.

Our Ordinary Meetings during the past year, I think we may say, have been remarkably well attended, especially when we consider that many of our members come from long distances; in fact, in no period of the Society's history have our meetings been so large, or the exhibits so numerous and varied. In very many cases these have been almost of a unique character, and have been accompanied by concise

notes. We have had a number of papers read before the Society, several of them from members who are separated from us by vast tracts of ocean, but are still with us in spirit. I allude more especially to Mr. Cockerell, who is endeavouring to recruit his health among the mountains of Colorado, and Dr. Percy Rendell, who is at the Cape of Good Hope. We, as members of a Natural History Society, should be always ready to benefit by mutual co-operation and aid; in fact more willing to give than to receive. We cannot, therefore, do better than to remember the motto of *The Entomologist* :—

“By mutual confidence and mutual aid,
Great deeds are done, and great discoveries made.”

We have held but two actual field meetings during the year, but we have had two most instructive gatherings in the Zoological Society's Gardens and the Royal Botanic Gardens, Kew; besides which Esher and Claremont was the district selected for the annual fungus foray.

The visit to the Zoological Society's Gardens, in May, was under the guidance of our esteemed member Mr. J. Jenner Weir, and to him are we indebted not only that the excursion was a most successful and pleasant one, but for a very instructive afternoon's entertainment. Some considerable time was spent in the reptile house, where we made the acquaintance of the pretty and harmless lizard; the fierce and gigantic crocodile; the hissing serpent, endowed with the brightest colours, and clothed in scales flashing in the light with a thousand varied metallic reflections.

“Terribly beautiful,
Wreath'd like a coronet of gold and jewels,
Fit for a tyrant's brow;”

and were introduced to that curious creature the manatee (*Manatus americanus*), from Demerara. Mr. Weir informed us that it belonged to the order Sirenia, or Sea Cows. This creature appears to be entirely aquatic in its habits, for it has been noticed that a previous specimen which was in the Gardens was totally unable to move when its tank was dry. It inhabits the shores and rivers of Eastern South America and Western Africa, feeding exclusively on water-weeds.

There are two other known species, the Floridan, *M. latirostris*, and the African, *M. senegalensis*. The family of the gulls (Laridæ) came in for a large share of admiration, as also the cranes, herons, etc. The Quadrumana and Carnivora had many special attractions, and that highly interesting class of animals the Felidæ, the cats, cheetahs, jaguars, leopards, tigers, etc., all received attention, Mr. Weir leaving no object of interest amongst the thousand and one that were set before us, without calling our attention to it.

Horsley, June 22nd.—This, the first of our field meetings, was under the especial care of a gentleman who thoroughly knew the neighbourhood, and was well conversant with its delightful surroundings. The day was all that could be wished for, and about thirty-four members attended. Mr. Carrington, our guide, to make the excursion less fatiguing, provided traps to meet us at the railway station, and convey us a distance of about two and a half miles on to the entomologist's hunting ground. This means of husbanding our strength for the clamber up the rugged hills, and the race with our nets which took place on reaching the top, was evidently much appreciated by all present. Although there did not appear to be any great abundance of insect life on the wing, our Lepidopterists captured several good species, and most of them were enabled to add something of interest to their collections. Several fine species of Ichneumonidæ were taken, as also several good Diptera. Our Botanists were not left without their share of spoil: amongst the very beautiful Flora, such species as the green man orchis (*Aceras anthropophora*, Brown), the bee orchis (*Ophrys apifera*, Huds.), the spotted orchis (*Orchis maculata*, L.), and the tway-blade (*Listera ovata*, Brown) being very plentiful, while several specimens of the musk orchis (*Herminium monorchis*, Brown), and the small white gymnadenia (*G. albida*, Rich.), were discovered and packed carefully away for the Herbarium. After tea a hearty vote of thanks to Mr. Carrington for the very able manner in which he had conducted the trip, brought to a pleasant termination one of the most agreeable of field meetings.

Westerham was the locality chosen for our July field ramble; but unfortunately for those who had anticipated

some good captures on this occasion, the weather, which had been very wet and cold for several days, still continued in the same unpropitious state. Twenty-two members, however, ventured to try their fortune; but alas! the paucity of insect life was painfully apparent, and few indeed were the insects netted, and those mostly dipterous. However, we enjoyed a very lengthened walk through the beautiful scenes for which the district is famed, Mr. Carrington missing no opportunity of pointing out anything and everything which was at all likely to interest his visitors; and it was agreed by all that the afternoon's walk, in spite of the weather, had been most enjoyable, and that the neighbourhood of Westersham was well worthy of future exploration.

On the 21st September the Society visited the Botanic Gardens at Kew, and had a pleasant and instructive day; in fact, it might well be termed a red-letter day for those visitors who were present. It was particularly fortunate that the magnificent South American water lily, the *Victoria regia*, was blooming. Those members who were early at the Gardens saw the entire development of the inflorescence, from the opening of the bud until the full expansion of the flower, upwards of a foot in diameter, the beautiful circular leaves of the plant, which are from six to eight feet in diameter, looking much like floating tables covered with velvet. The Palm House was then visited, and some idea obtained of the luxurious growth of tropical vegetation, both by walking on the paths under the trees and realizing, partially, the sombre character of an intertropical forest, and then by ascending into the gallery, where we were better enabled to understand how each species struggled up towards the light, and thus made the real flower-garden over head, instead of as in our climate, under foot, or at any rate much nearer the ground.

The members then walked through the Arboretum to the Temperate House. Here we find that the plants are arranged phyto-geographically, so that the features which distinguish the vegetation of the temperate regions of the whole earth are presented in their respective divisions. We thus had a good opportunity of seeing how much the singular vegetation of Australasia differs from that of the other continents. The

numerous species of *Eucalyptus*, *Banksia*, and *Casuarina* have a dried-up appearance, contrasting unfavourably with the rich green of the leaves of the plants and trees from the temperate regions of Europe, Asia, and North America.

The visit to the Cactus House, which contains the finest collection of these plants in the world, and exhibits every form of the grotesque shapes characteristic of this peculiarly American group, brought to a close a most instructive and entertaining afternoon, and to Mr. Jenner Weir is due the very best thanks of the Society for the kind and unselfish manner in which he placed himself at our disposal, leaving no object of interest unobserved.

The Annual Fungus Foray was held on October 26th, at Esher and Claremont ; but Mr. Step, who undertook to conduct us, informs me that it was an almost total failure, very few of the members meeting on the occasion, and that those who did go met with but little success. This was no doubt owing to the lateness of the season, and the unfavourable meteorological conditions of the previous week, several very severe frosts having taken place, followed by heavy rains. This was especially to be regretted as the Council purposely appointed the meeting a fortnight later than it would otherwise have been in hopes of having a fine show at our Exhibition. The Hackney Microscopical Society held their hunt on September 8th, and were rewarded with no less than 130 species. This, I think, clearly points to an error on our part, and I would suggest that in future, if our Executive finds it necessary to hold the Annual Exhibition as late as the last day in October, it would be wise to have our hunt early in September, and hold a Cryptogamic Exhibition by itself. It would then be possible for others of our members, whose hands as well as heads are busily engaged in making our Annual Exhibition a success, to join our mycological botanists in the search for specimens.

I do wish that it were possible to arouse more interest in these field meetings. I fear that many of our members think that we go out as mere holiday makers. I should like to undeceive them on that point. We go as students of Nature, anxious to penetrate deeply into the many and varied branches of Natural History. Even our specialists who accompany

us into the field feel their many wants and imperfections, and leave no stone unturned, or hedgerow neglected, in hopes of gaining further information from Nature's storehouses, and if possible adding some other rarity to their collections. For the encouragement of our younger members who may have seen some of the many thousands of insects which were on view at our late Exhibition, and may perhaps have gone away with the idea that there was no more to be done or opportunity for them to be known in the entomological world, I would simply say that the stores are not yet exhausted, nor have Nature's bounties left off flowing, but observant eyes are needed. To prove my case I perhaps may be allowed to read a small quotation from Lord Walsingham's Address to the Entomological Society of London, last week. Speaking of the progress of Entomology and the work that remains to be done, his lordship said : "Some attempts have been made from time to time to arrive at the number of species of true insects of all orders existing on the face of the globe. Dr. John Davy, in a letter to W. Spence, in 1853, estimates that 250,000 species of insects exist (*Tr. Ent. Soc.*, n. s. iii. p. 32). The latest of these calculations is perhaps that of my predecessor in this chair. At a meeting of the Dumfriesshire and Galloway Natural History Society, held at Dumfries in 1883, Dr. Sharp said : 'As the result of a moderate estimate it appears probable that the number of species of true insects existing at present on our globe is somewhere between 500,000 and 1,000,000 ;' and expressed his own opinion, in which I entirely concur, 'that the number probably exceeds the higher of these figures, and will come nearer to 2,000,000.' Dr. Sharp has been good enough to give me the approximate number of distinct species of Coleoptera described up to the present time ; he puts these at about 120,000, basing his calculation upon the *Munich Catalogue*, published in 1868, which contained 77,000 species, and upon the additional descriptions since published. I think, Gentlemen, there is here plenty of encouragement for all to go forward in this delightful pursuit, and it may be said with truth, that in the study of Natural History we have a pure democracy, where all objects are as real and as beautiful for the toil-worn artisan as for Cræsus with all his gold."

Our Annual Exhibition, which this season was open for two days, the 30th and 31st of October, was again a very great success, beyond our most sanguine expectations, being visited by upwards of 2,200 people. Our Exhibition Committee, Messrs. Adkin, Barker, Carrington, Manger, South, Tugwell, Rice, and Yardley, were indefatigable in their exertions, and worked with such unanimity that there was no possibility of failure; and although it was thought that hardly so large a number of specimens was brought together as on our last Exhibition, the deficiency was well made up for by the valuable quality of the objects lent by our many friends. Probably one of the most interesting and instructive sights was the exhibition of living ants, kindly lent by Mr. H. Burns, F.E.S., who spared no pains in explaining to the numerous visitors the habits of these little creatures. Amongst the species which he exhibited we noticed a nest of *Myrmica scabrinodes*, Nye, which he had brought from France; another of *Lasius flavus*, De Geer.—in this family the queen might be seen attended by her numerous court—and several other species, the whole occupying a large room, which was crowded by an appreciative audience both evenings: in fact, I fear, a number of our own members missed certainly one of the most instructive sights in the Exhibition. If so, it may be some gratification to them to know that Mr. Burns has kindly promised not only to exhibit his little pets again, but also to read a paper on their life history, etc., during the coming spring. The large room was again filled with vast numbers of specimens of Natural History, embracing most known orders in the insect fauna, and many valuable specimens from the ornithological world, some of the objects on view being unique. For me to attempt to individualise where all was so good, would be quite out of place; but I cannot help thinking that the innovation of introducing living objects, such as the valuable birds of Mr. Castang, the newts and snakes of Messrs. Adkin and Cook, as also the water spiders of Mr. Perks was a step in the right direction, for the more we are enabled to observe Nature's living wonders the greater will be our surprise that we have not sooner become students of her marvellous organisms.

I cannot pass by the South London Microscopical Society

without according to its members, who have always been so willing to assist us, our very heartiest thanks for the valuable aid rendered on this as on previous occasions ; neither can I forget the valuable services of Mr. G. Day, who not only brought down his triplexicon lantern, but entertained us with four most instructive lectures upon "Parasites," "Plant Life," "Nest Builders," and "Microscopic Wonders."

Our Exhibition Committee, not liking to lose the attraction of the Fungus Table, deputed several gentlemen to go to Esher on the Tuesday previous to the opening ; and Mr. Step informs me that more material was brought together than on any previous occasion, but not in the condition he could have wished, owing to the atmospheric conditions previously mentioned. To our very numerous friends who assisted us by the loan of objects, we return our very hearty and grateful thanks, feeling sure that they have materially assisted in strengthening the Society by bringing in additional members whose interest in Natural History has been awakened by the sight of natural beauties which they had hitherto not dreamed of. And my sincere hope is that it may be long before this Society ceases to hold its Annual Exhibition.

We are assured by an old proverb, that there is "nothing new under the sun," but our naturalists, taking exception to this aphorism, still assert that the Fauna of the British Isles is yet far from being worked out ; and as several new and rare species of the class Insecta have been discovered during the past year, I purpose calling your attention to some few of them, and referring you as far as possible to the published records of the same.

Lepidoptera.

Hesperia lineola, Ochsenheimer. This is probably the most interesting addition to our fauna list, from a Lepidopterist's point of view, being the discovery of a new butterfly. To one of our own members, Mr. F. W. HAWES, are we indebted for the introduction of this little curiosity of the Family of Skippers (Hesperiæ). Mr. HAWES' specimens are all males, and were really taken in 1888, but have only recently been identified. Mr. CARRINGTON has also taken both sexes of the same species this season, but I think I understood him to say from forty to fifty miles from the district in which Mr. HAWES captured his specimens. The insects were

exhibited in these rooms at our last meeting by both gentlemen ; Mr. JENNER WEIR also exhibited a specimen which had been in his collection for some time, but he could not state the locality from which it came. For a full description I would refer members to *Entom.*, xxiii. p. 3.

Acrolepia assectella, Zeller. To our veteran Lepidopterist, Mr. STANTON, is due the honour of adding to the British List of Tineæ this new species, which has long been known on the Continent and as near home as Brussels and Paris. Mr. STANTON'S attention was called to some onions which had been grown for seed, the seed-heads of which appeared to have been attacked by some kind of disease ; these on closer examination he found to be infested by the larvæ of *Acrolepia assectella*, which had been feeding on the stems supporting the flower and seed. From the larvæ thus obtained Mr. STANTON bred a series of the little moth which in future will figure in our list of British *Acrolepiæ* (*Ent. Mo. Mag.*, xxv. p. 291).

These two species of Lepidoptera are all that have been recorded as new during the past season ; but several rarities have been observed, and I think they are well worthy of notice on this occasion.

Parnassius (Doritis) apollo, L. A specimen of this noble butterfly is said to have been observed hovering over the cliffs at Dover on the 28th of August last, by Mr. SABINE, Junr., but the very treacherous nature of the ground prevented any attempt at capture (*Entom.*, xxii. p. 278).

Colias hyale, L., was seen by the Rev. J. L. TARBAT, near Whiteleys, Reading, on the 2nd of September (*Entom.* xxii. p. 256.)

Colias edusa, Fb., appears to have been observed in several localities, and to have been fairly common in some places. It has been recorded from Essex, Surrey, Isle of Wight, Berkshire, Gloucestershire, Devonshire, South Wales, and Lancashire. From the two latter localities new specimens are recorded as captured (*Entom.*, xxii. pp. 255, 278).

Vanessa antiopa, L. This very handsome species has been captured in localities somewhat wide apart. It is recorded from Guestling by the Rev E. N. BLOOMFIELD, while Mr. E. SAUNDERS speaks of it being taken at Beckenham. Mr. GOSS records its capture at Barcomb, Sussex. A fine specimen has been taken at Leytonstone, Essex ; and it has also been observed at Battle, Sussex, and Liss in Hampshire (*Ent. Mo. Mag.*, xxv. p. 429 ; *Entom.*, xxii. pp. 257, 306).

Sphinx convolvuli, L. This fine species of the family Sphingidæ is reported from numerous localities : Regent's Park, hovering over the bloom of *Nicotiana affinis* ; from Reading, resting on a paling ; from Christchurch, Hants, by one of our members, Mr. ADYE ; Chipping Norton, again at the bloom of *Nicotiana* ; from Penarth, at the bloom of a balsam ; while at Porthkerry, two were taken at the fascinating tobacco. At Manchester, one was taken from the wall of a greenhouse ; several were observed busy at tobacco. From Ramsgate we again hear of its capture at tobacco ; while Aberdeenshire and Devon add their quota. A gravestone at Leicester was the resting-place of one ; the bloom of the petunia attracted two in the Isle of Wight ; while from other places, too numerous to specify on this occasion, it is also announced (*Entom.*, xxii. pp. 258, 280 and xxiii. 18 ; *Ent. Mo. Mag.*, xxv. p. 456).

Deilephila galii, Schiff. Two specimens of this lovely moth are reported to have been captured in the neighbourhood of Chester ; while a third, a fine male, was taken at rest in a garden at Sowerby Bridge, Yorkshire (*Entom.*, xxii. pp. 211, 234).

Deilephila euphorbiæ, L. The Rev. J. SEYMOUR ST. JOHN, writing from Stamford Hill, N., records the capture of thirteen nearly full-fed larvæ of this very rare insect, which were taken by a friend, feeding on the Sea Spurge (*Euphorbia paralias*, L.), but he gives no locality. They have since pupated, and ten apparently healthy pupæ were in the gentleman's possession at the time of writing his note, November 22nd (*Entom.*, xxiii. p. 18).

Chærocampa celerio, L. On the 1st of October, a lad took a fine specimen of this insect at rest on the framework of a greenhouse, at Hartlepool (*Entom.*, xxii. 281).

Caradrina ambigua, Fab. Mr. TUTT records the capture of a worn specimen of this rarity, by himself, at Yarmouth, Isle of Wight, and his observation of two other fine specimens in the collection of Mr. A. J. HODGES, which were taken in the same locality in the year 1888 (*Entom.*, xxii. p. 235).

Stigmonota ravulana, H-S. It might be worth while to call attention to the capture of this interesting Tortrix in June, 1888, at Renfrewshire, although not recorded until February of last year (*Entom.*, xxii. p. 18).

Coleoptera.

Anaspis garneysi, Fowler. This good species has only just been added to the British list, although it was captured in some numbers by the late Dr. POWER at Ditton, Horsell, Cowley, and

Claygate, some years since. To the Rev. Canon FOWLER is due the honour of describing the species, which he has named after an old and much esteemed Coleopterist, the late Mr. W. GARNEYS (*Ent. Mo. Mag.*, xxv. p. 333).

Anaspis melanostoma, Costa. This species, which is well known on the Continent, has been added to our list on the strength of a specimen found in Dr. POWER's collection, taken at Darenth Wood, June 3rd, 1860 (*Ent. Mo. Mag.*, xxv. p. 335).

Having recorded the only two new Coleoptera, it would perhaps be well to notice the capture of several rarities.

Heptaaulacus villosus, Gyll. This rare little species of Scarabæidæ fell to the nets of Mr. J. J. WALKER and Dr. SHARP in some profusion at Cobham Park, on the 20th of June last; while the equally rare little *Abræus granulum* was secured by Mr. J. J. WALKER on the same occasion (*Ent. Mo. Mag.*, xxv. p. 359).

Pentarthrum huttoni, Woll. This interesting species of Calandridæ was again taken from a white poplar in the neighbourhood of Plymouth, by Mr. J. H. KEYS in May last, he having previously met with it in the same habitat in 1888 (*Ent. Mo. Mag.*, xxv. p. 326).

Medon piceus, Kr., and *Actobius signaticornis*, Rey., were taken by Mr. BEAUMONT and myself from a heap of weeds and vegetable refuse at Lewisham on May 19th (*Ent. Mo. Mag.*, xxv. p. 364).

Time will not permit me to refer to more species of Coleoptera, especially as other orders have yet to be noticed. I am, therefore, compelled to omit many other recorded captures of rarities in this order and pass on to

Diptera.

Myopa polystigma, Rond. Our member Mr. BRUNETTI, records the capture of two specimens of this species, which is new to the British list, in an orchard at Painswick (*Ent. Mo. Mag.*, xxv. p. 281).

Syrphus excisus, Zett. This interesting species has been added to our list on the strength of two males taken in July, 1887, and one female in July, 1888, by another of our members Mr. CORYNDON MATTHEWS, who captured them at Ivy Bridge, South Devon (*Ent. Mo. Mag.*, xxv. p. 379).

Hyetodesia consobrina, Zett., added to our list by Dr. MEADE, from a specimen taken by Miss PRESCOTT-DECIE at Chagford, South Devon, in May, 1888 (*Ent. Mo. Mag.*, xxv. p. 395).

Hyetodesia sudetica, Schnabl. New to the British list, and described from two specimens captured by Dr. MEADE at Baslow, Derbyshire, July, 1887 (*Ent. Mo. Mag.*, xxv. p. 396).

Spilogaster atripes, Meade, two males of which were taken at Hornsea, near Hull, by Dr. MEADE, and *S. spinifemorata*, Meade, captured at Bontddu, North Wales, by Miss PRESCOTT-DECIE in August, 1881; as also *S. fratercula*, Zett., taken at Baslow, Derbyshire, by Dr. MEADE. All are new to the British list, the two former being new to science (*Ent. Mo. Mag.*, xxv. p. 425).

Hydrotæa parva, Meade. This little fly is new to science, and described from a solitary specimen captured in an osier bed at Buckingham by Mr. MEADE in 1887 (*Ent. Mo. Mag.*, xxv. p. 448).

Chortophila curvicauda, Zett., is added to our list from numerous captures made by Dr. CAPRON at Shiere, near Guildford, Surrey, in April, 1888 (*Ent. Mo. Mag.*, xxv. p. 449).

Hemiptera.

Scolopostethus neglectus and *S. punctatus*, Edwards. These two new Hemiptera have been added to the British list by Mr. JAMES EDWARDS, who has captured the former in some numbers in the neighbourhood of Norwich; while the latter is described from specimens in the collection of Mr. E. SAUNDERS (*Ent. Mo. Mag.*, xxv. p. 279).

Lygus viscidola, Puton., is introduced into the British Fauna by Mr. DOUGLAS, from specimens received from Dr. CHAPMAN of Hereford, where it has been found plentifully on the mistletoe only (*Ent. Mo. Mag.*, xxv. p. 396).

Anthocoris visci, Doug. This little Hemipteron, which is new to science, is one of the results of looking out for the previous species on the mistletoe (*Viscum album*). It was found by Dr. CHAPMAN, and sent by him to Mr. DOUGLAS, who has described it (*Ent. Mo. Mag.*, xxv. p. 427).

Hymenoptera.

Apanteles hoplites, Rtzb., is added to our fauna list by Mr. J. B. BRIDGMAN, who describes a female of this species, which was bred by Mr. W. H. B. FLETCHER from *Gelechia populella*, Clerck., in 1885 (*Ent. Mo. Mag.*, xxv. p. 282).

Bombus scrimshiranus, Kirby, and *B. pomorum*, Panz. Mr. F. D. MORICE has had the good fortune to take both these rarities this season; the former at Wimbledon, in September, and the latter at Beachy Head in the same month. This gentleman has also been successful in taking some numbers of the exceedingly rare *Halictus atricornis*, Smith, near Rugby, and also at Whalley in Lancashire; and as though this were not enough of good things to fall to one net in a season, he has also captured one each of the following rare

fossorial Hymenoptera : *Hoplisis bicinctus*, Rossi, and *Priocnemis affinis*, V. de Lind. (*Ent. Mo. Mag.*, xxv. p. 434).

Neuroptera.

Lype fragilis, Pict., and *Agapetus delicatulus*, McLach. These two species of Trichoptera are added to the British list by Mr. J. F. X. KING, who has met with the former, common at Lough Corrib near Galway, Yewpoint, and Summerhill, on the Connaught side, and Lough Ree near Athlone ; while the latter was taken at Torc Cascade, Denough River, and in the Horses' Glen, Mangerton, near Killarney (*Ent. Mo. Mag.*, xxv. p. 235).

Setodes punctata, F. A species of Trichoptera well known in France, Holland and Sweden, has been added to the British list by Mr. J. E. FLETCHER, who swept a solitary specimen from an ash tree on the banks of the river Severn, in July last (*Ent. Mo. Mag.*, xxv. p. 383).

Æschna borealis, Zett. Five specimens of this rare boreal and alpine dragonfly were taken by Messrs. KING and MORTON in its old haunts near the Black Wood, Rannoch, on the 22nd June (*Ent. Mo. Mag.*, xxv. p. 383).

Orthoptera.

Forficula pubescens, Gén  . This new earwig is added to our list by Mr. ELAND SHAW, who describes it in his New Synopsis of British Orthoptera, from specimens sent to him by Mr. C. W. DALE, who found it amongst reeds at Charmouth, Dorsetshire (*Ent. Mo. Mag.*, xxv. p. 358).

Knowing that we have amongst our members some who pay especial attention to our flora, I think it is only right that they should be informed, if they do not already know the fact, of the discovery of a new British Alga, or Seaweed.

Rhododermis elegans, Cr., var. *polystromatica*. For the addition of this elegant marine plant to our flora, we are indebted to Mr. E. M. HOLMES, who has discovered it growing at Bognor, and to Mr. E. L. BATTERS, who has also found it at Berwick-on-Tweed. Hitherto it had only been known to occur at Brest (*Zoologist*, xiii. p. 112).

"Of making many books there is no end," so said a very ancient writer ; if this was the case in the time of Solomon, what are we to say of the condition of literature now-a-days ? No less than 8,078 volumes have been published in the United Kingdom during the year that has just closed, London alone

being responsible for 6,774. Among this vast amount of literature there is a great deal bearing upon Biological subjects, and therefore of interest to ourselves; but it cannot be expected that I should do more than call attention to a few of the most important.

The third volume of "The Larvæ of British Butterflies and Moths," by the late William Buckler, has been issued by the Ray Society. This is a most valuable work, especially to Lepidopterists. Miss E. A. Ormerod is again well to the front, with her "Twelfth Annual Report of Observations on Injurious Insects and Common Farm Pests." This little work should be in the possession of all who are interested in the subject, especially agriculturists and horticulturists.

It might not be out of place to call attention to the change of proprietorship of the *Entomologist*, which will in future be edited by Mr. South, who is very well known to most of us; and whose name is, I think, a guarantee that it will lose none of its present popularity. Also to the new series of the *Entomologist's Monthly Magazine*, conducted by Messrs. Stainton, McLachlan, Barrett, and others; the first of these works having an existence of twenty-three years, and the latter twenty-five years. They are familiar magazines to most of us, and I would strongly recommend all entomologists to subscribe to both of these valuable works, if they do not already do so.

"A Contribution towards a Catalogue of the Neuropterous Fauna of Ireland." By James J. F. X. King; Glasgow Natural History Society, 1889. A very useful addition to our knowledge of the Fauna of Ireland, which should be on the bookshelves of all who study Neuroptera.

"The Butterfly: its Life-history and Attributes." By John Studland. London: T. Fisher Unwin, 1889. Price, one shilling. An elementary work, but at the same time a most useful little book for the student who is just beginning entomology.

"Proceedings of the Dorset Natural History and Antiquarian Field Club, Dorchester." This Society is doing excellent work in entomology, and its proceedings should be of value to the systematic entomologist. The work contains some excellent papers, with coloured and plain plates. In

Vol. IX. reference is made to a moth new to Britain, *Butalis siccella*; and in Vol. X. to "New and Rare British Spiders," as also to "A New Species of *Epischnia*." Practical entomologists will find this a most valuable work.

"The Flora of Maidstone." By H. Lamb. Will be welcomed by all botanists as a most exhaustive list of the Flora of the neighbourhood.

"Index Generum Avium; A List of the Genera and Subgenera of Birds." By F. H. Waterhouse, Librarian to the Zoological Society of London. Will be found a valuable and much-needed Index for ornithologists, Mr. Waterhouse having arranged alphabetically about 7,000 names of genera and subgenera, which have been used by various authors since 1766.

"Sylvan Folk; Sketches of Bird and Animal Life in Britain." By John Watson. An interesting little work dealing not only with birds, but also some of the smaller mammals.

"Our Rarer Birds; being Studies in Ornithology and Oology." By Charles Dixon, with Illustrations by Charles Whymper. The author having had the opportunity of studying various birds in their natural haunts, is enabled to give a fairly accurate description of their habits.

I fear I have already taxed your patience severely, or I might refer to numerous valuable notes in our different Natural History Magazines; but those already brought before your notice will, I think, suffice. We may well say with Kingsley in his *Glaucus*, "Happy truly, is the Naturalist. He has no time for melancholy dreams. The earth becomes to him transparent; everywhere he sees significances, harmonies, laws, chains of cause and effect endlessly interlinked, which draw him out of the narrow sphere of self-interest and self-pleasing into a pure and wholesome region of solemn joy and wonder."

Gentlemen, I must now ask your sympathy for the families and friends of deceased naturalists, who have passed away from us since our last Obituary record. I will endeavour to be as brief as possible with this painful portion of my duty. We have lost a young member in the person of MR. B. W.

MULLINS, who only joined the Society in 1886. I have been unable to learn the cause of his death, or his speciality in the study of Natural History.

MR. HENRY LEE, F.L.S. The Naturalist to the Brighton Aquarium, died at the comparatively early age of sixty years. He was more particularly known to scientific literati for his entertaining work, entitled "The Octopus; or the Devil-Fish of Fiction and Fact."

REV. CHURCHILL BABINGTON, D.D., F.L.S., passed away on the 13th of January last, at the age of 67. He was a very eminent botanical scholar, as well as an excellent naturalist; and although he will probably be better remembered for his classical and archæological accomplishments and his skill as a palæographer, his researches in the fields of Zoology and Botany were of no mean order. So long since as 1842 he contributed to Potter's History of Charnwood Forest, an Appendix on the Botany and Ornithology of that district, following later on with a volume on the Birds of Suffolk, which was published in 1886. To botanical students he was known as an authority on Lichens, being a contributor on that subject to Hooker's Flora of New Zealand. He will be especially missed by those who had the pleasure of calling at his charming rectory, and revelling amongst the treasures of nature, which he in his kindly hospitality delighted to exhibit to his guests.

The REV. JOHN GEORGE WOOD, M.A., died on the 3rd of March, at Coventry, after a brief illness, while on a lecturing tour. He was born in London in 1827, and graduated at Merton College, Oxford, being ordained in 1852. He was for a time attached to the Seamen's Floating Chapel, and was also Chaplain to St. Bartholomew's Hospital. He, however, did not continue long in active clerical duties, abandoning them for the, to him, more congenial sphere of writing and lecturing upon Natural History subjects. In this work he was highly successful, and has probably done more to popularize the study of Natural History among the masses than any other writer of modern times. His "Homes without Hands," being a description of the Habitations of Animals classed according to their Principle of Construction; his "Insects at Home;" his "Common British Insects;"

"Insects Abroad;" "Out of Doors," being a selection of Articles on Practical Natural History; and his "Bible Animals," giving a description of every living creature mentioned in the Scriptures, with many other writings of a like description, will help to keep amongst us his name as a household word for many years to come. He left a widow and large family to mourn his loss. His eldest son, the Rev. Theodore Wood, is well known to many of us as an ardent student and successful collector of British Coleoptera, and as the author of several little works on elementary and economic Entomology.

WILLIAM BRODRICK, whose name we cannot omit, passed away at the ripe age of seventy-four, deeply regretted almost as much by those who knew him by reputation only, as by the many personal friends he has left behind. He died on December 21st, 1888, at Littlehill, Chudleigh, North Devon, where he had resided for upwards of twenty years. He was educated at Harrow, and took his degree at University College, Oxford. Apropos of his life-long love for Natural History, he used to say that he never learned anything at Harrow, but how to catch birds, yet his degree pointed to something beyond that. He studied medicine, but never chose to practice. Settling down at Belford, Northumberland, he became an enthusiastic lover of falconry, hawking over the moor of his uncle, Mr. Selby, of Ixizel, a name well-known to ornithologists. Here he procured and trained many fine falcons and tiercels; and it is as a writer on falconry, and an admirable draughtsman and painter of birds of prey, that Mr. Brodrick was and will be widely known. In 1855 he published his admirable work, "Falconry in the British Isles," the illustrations to which were all drawn by himself from life, he being assisted in the letterpress by his friend Captain F. H. Salvin. He will also be remembered by his charming folio plates of Hawks, entitled "Falconers' Favourites." His life-long study of the habits and attitudes of birds of prey, in motion and at rest, with his skill as a taxidermist, has resulted in the production of some of the most remarkable groups of stuffed birds, with which we are acquainted. He has also left behind him some most wonderful drawings of the external form and internal structure of British Mollusca and

Sea-Anemones, prepared under high microscopic power, many of these magnificent drawings being coloured. In August, 1857, he discovered on the rocks of Lundy Island, at low water, a Sea-Anemone new to science, *Phellia brodricii*, which was described by the late Mr. P. H. Gosse, in the Annals and Magazine of Natural History, and figured later on in his celebrated "History of British Sea-Anemones and Corals."

FREDERICK BOND, F.Z.S., F.E.S. On the 10th of August, at Staines, aged 79 years, passed peacefully and quietly away a sincere and beloved friend of naturalists generally, in the person of Frederick Bond. Ornithologists and entomologists of the present generation have lost not only a friend but a guide and philosopher as well, and in him the Entomological Society of London has lost one of its oldest members, he having been elected in 1841. He joined the Zoological Society in 1854. Mr. Bond had no taste for writing long articles; but short notes from his pen may be found scattered through the journals of Natural History for the past fifty years. He more especially studied British Birds and their eggs, and Lepidoptera. Of the latter he was a most assiduous collector, and he has left behind him probably the most extensive and representative collection now in existence. Mr. Bond might well be termed a British Naturalist, he having but little interest in anything outside of the British Isles. In the hearts of his many friends his memory will still live on; while by future naturalists he will be best remembered by his eponyms, the British Noctua, *Tapinostola bondii*, and the Indian Longicorn, *Xynemon bondi*. My limited space will not permit me to enlarge upon the very many interesting episodes in the life of this departed naturalist; but I cannot let the opportunity pass of calling your attention to the able Memoir by Mr. Dunning, in the November number of the *Entomologist*, and to the lengthened record in the *Zoologist* for the same month.

REV. H. J. GORE, M.A., died at Hampstead on September 3rd, aged 75. For many years he was the Rector of Rusper, near Horsham, Sussex. He published very little; but as a field naturalist he was noted for being an indefatigable collector of British Coleoptera.

WILLIAM STAFFORD. The veteran ornithologist of Surrey departed this life peacefully on September the 21st, at Godalming, at the ripe age of 80. He was one of a group of self-taught naturalists, two of whom—the late Edward Newman (Author of the “Letters of Rusticus,”) and J. D. Salmon (“Flora of Surrey”)—were his staunch friends and fellow-townsmen. He never published anything, but dispensed his great local knowledge through others of more literary habits. His favourite study was the vertebrate fauna, and he was the chief authority on the birds of Surrey, of which he has left a magnificent collection, obtained by himself during more than fifty years of observation, stuffed and mounted by his own hand. Almost every naturalist who has passed through Surrey has visited his charming homestead at Godalming, more especially if desiring to gain any knowledge of the reptiles and birds of the county. To all of them he imparted information with the fulness and freedom which were his notable characteristics.

PROF. WILLIAM RAMSEY MCNAB, M.D., F.L.S., died suddenly at Dublin, from heart disease, on December 3rd, at the early age of 45. He was educated for the medical profession, and took his degree at Edinburgh in 1866, and for a short time held an official appointment. But the hereditary instinct for Botany, descending from father and grandfather, seemed to prevail, and he became Professor of Natural History at the Royal Agricultural College at Cirencester, and subsequently of Botany at the College of Science at Dublin, and at the time of his death was scientific director of the Royal Botanic Gardens at Glasnevin. His name frequently occurs in the early volumes of the *Entomologist's Monthly Magazine* in connection with Scottish Coleoptera, and he was the authority for several species recorded in the late Andrew Murray's Catalogue.

It now only remains for me, Gentlemen, to thank you for the patience with which you have listened to the disconnected sentences brought before you this evening, and for the very courteous and kind attention shown me during my term of office. In my successor, Mr. Carrington, whom you have elected this evening, you have a first-class biologist,

well-known to all, who I feel sure will, with the assistance of the able body of colleagues you have elected to support him, spare neither time nor talent to make the South London Entomological and Natural History Society not only a benefit to all who are immediately connected with it, but a tower of strength amongst the Biological societies.

T. R. BILLUPS.

ABSTRACT OF PROCEEDINGS.

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JANUARY 10th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Jenner Weir exhibited specimens of *Limnæa truncatula*, Müll., collected by Mr. Cockerell in Colorado, which appeared to be in all respects identical with the ordinary English form of that species.

Mr. Jenner Weir also exhibited a ♀ specimen of *Anosia plexippus*, L., which he had received from Mr. Cockerell, Custer County, Colorado. Although in this specimen the inner edge of the wing was quite as black as in those received by him from Canada and Hudson's Bay, it yet differed in the colour of the spots on the fore wings being all white, whereas in the northern specimens the four large central spots were of a fulvous brown, little inferior in richness to that of the disk of the wing.

He exhibited at the same time the water-colour drawing which Miss Crallan had made from the specimen taken at Lindfield in 1876, from which it would appear that the example then captured resembled the more Northern form of the species.

Mr. Jenner Weir also exhibited the following, received from Mr. Cockerell:—

Melitæa minuta, Edwards, a small species allied to *M. athalia* Rott., *Parnassius smintheus*, closely allied to, if not a geographical race of, *P. delius*, Esp., of the Alps.

Euchloe ausonides, a species similarly allied to the European *E. ausonia*, Hb.

Pieris oleracea, ♂ and ♀, Boisd. This species he had contended was not identical with our well-known *P. napi*, L., and he was glad to read a communication he had received from Mr. Scudder on this point:—"I have to-day, for the first time, been able to make the comparisons I wished from the specimens you sent me, and I can report that the

European *napi*, and the American *oleracea*, can be distinguished from each other in the caterpillar and chrysalis as surely and readily as *napi* and *rapæ* can be distinguished at the same stages." We may therefore expect to find this vexed question cleared up in Mr. Scudder's excellent work now being issued.

Mr. Chittenden exhibited very black forms of *Acidalia inornata*, Haw.

Mr. J. A. Clark exhibited dark varieties of *Cidaria suffumata*, Hb., black suffused forms of *Melanthia bicolorata*, Hufn., var. *plumbata* Curt., from Forres, and a variety of *Oporabia dilutata*, Bork., having black bands across the wings, taken at Brighton, 1888.

Mr. R. Adkin exhibited *Noctua glareosa*, Esp., from Kent, Barnsley, York, Perth, Forres, and Shetland. The Shetland specimens and one of those from Perth approaching a melanic form, the others being all of the pale grey or slightly rosy type.

Mr. W. H. Tugwell exhibited a series of nine *Boletobia fuliginaria*, L., and read the following note:—

"Eight of the specimens of this rare British moth exhibited this evening, were captured or bred by Mr. Edward Upton, at Dockhead, Bermondsey. The one smaller specimen I had the pleasure of breeding from a half-grown larva (one of four) that Mr. Upton showed Mr. J. T. Williams and myself, when on May 24th, 1884, we went by appointment to be shown *fuliginaria* at home. The four larvæ we saw on that occasion were feeding on fungus on an old rotting wooden structure near a tidal ditch from the river Thames, and at a place that could only be approached under certain conditions of tide. One of these four larvæ, about half grown, Mr. Upton most generously allowed me to bring away, and this I fed up (on the piece of fungoid wood shown) and successfully bred. I call particular attention to the pupa case attached to the piece of wood. It will be seen that the larva forms a slung cocoon, *i.e.*, attached at both ends by silken threads. It does not go underground to pupate, as is stated by Kirby in his translation of Berge's book. I am of opinion that the insect is a true Geometer, rather than a Noctua, as Mr. South classes it in his "Synonymic List." The sketch of larva, from nature, was made by my daughter, showing it feeding and in repose."

Mr. White exhibited a coloured drawing of *Catocala nupta*,

L., the red colour of the secondaries being replaced by blue ; the variety was taken by Dr. Laver at Colchester. Mr. Weir observed that the wings were of the same colour as *C. fraxini*, L.

JANUARY 24th, 1889.

ANNUAL GENERAL MEETING.

T. R. BILLUPS, Esq., *President*, in the Chair.

Rev. J. Greene, M.A., F.E.S., was elected a member.

The evening was devoted to receiving the reports of the Council and Officers, the election of Officers for 1889, and the reading of the retiring President's address.

FEBRUARY 14th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. C. A. Vine was elected a member.

Mr. J. T. Carrington exhibited several specimens of a Braconid, which Mr. Billups said was *Rhogas circumscriptus*, Nees, bred from a larva of *Acronycta alni*, L., found in Carmarthen, 1888.

Mr. Weir exhibited three male and three female specimens of a butterfly he had received from the Falkland Islands. They were of the same genus as our well-known *Brenthis* (*Argynnis*), *selene*, Hüb., and *B. euphrosyne*, L., and were apparently closely allied to the Chilian *Brenthis anna*, Blanch. (Mr. Weir has since ascertained that they were the *Argynnis cytheris* of Drury.) It was an interesting fact that Palæarctic and Nearctic genera of Lepidoptera reappeared at the southern parts of South America which were quite unknown over a vast extent of the intermediate latitudes ; but it should be borne in mind that there was in the American continent an almost continuous chain of mountains from the Arctic Ocean to the Straits of Magellan, which might have formed a connected temperate region, by which the migration of species from the north to the south may have been effected, at a time when the temperature of the earth was different from that which now obtains.

Mr. W. H. Tugwell exhibited a variety of *Deilephila galii*, Schiff., bred 1889, from larvæ obtained at Deal. Two of this form were bred, but as a rule this species is wonderfully

constant. In this variety the usual characteristic dark olive-green markings are replaced by dull grey, whilst the pale streak that runs from the inner margin to the tip of wing is obscured and dull in colour. The inferior wings are dull pale grey, lacking the usual rich rose shade at the anal angle. The body is also grey, instead of olive green." Mr. Tugwell also exhibited a variety of *Chærocampa porcellus*, L., in which the usual deep rose-pink colour was almost absent, only the body being normal. The superior wings with a very narrow costal line of rose colour, the entire disc of wing, pale olive green, with faint grey shading, the hind wing pale olive green, shaded with grey marking.

Mr. Carrington, with reference to the varieties of *D. galii*, said that the variation appeared to be caused by an absence of the ordinary pigment. Mr. White asked whether Mr. Tugwell could give details of the exact conditions under which the varieties of *D. galii* were bred, as they seemed to be in a somewhat immature condition, the hairs apparently adhering to the body and abdomen as if the specimen had not freely developed; it would also be of interest to know at what temperature the specimens had been developed, and the time of emergence as compared with the normal examples that were bred. Mr. Tugwell, in reply, said the larvæ were found and fed at Deal, as far as possible under natural conditions; most of them pupated there; but in order to force them, they were, on his return to London, placed on sand and covered with damp *sphagnum* in a room where the temperature was kept at about 70°; the two varieties emerged in the month of January, and were the only two that varied in any way, although he had bred some seventy specimens up to that date. He was not prepared to give any reason for the semi-diaphanous appearance of the specimens, but he thought Mr. White was hardly correct in suggesting that the specimens were not properly developed.

Mr. C. A. Briggs exhibited *Triphæna comes*, Hb., and *T. orbona*, Hufn., from various localities, calling attention to the *T. orbona*, from Unst, which showed hardly any variation.

Mr. Turner exhibited pale pink forms of *Zygæna filipendulæ*, L., bred from pupæ collected at Reigate, Surrey.

FEBRUARY 28th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Miss K. M. Hinchliff, Messrs. J. F. Perry, A. W. Nott, H. Moore, G. J. Randall, W. H. McLachlan, and J. Smith were elected members.

Mr. R. Adkin exhibited *Dioryctria abietella*, Zinck, from Forres, N.B., and from Sutton, near Deal, Kent.

Mr. Tutt remarked that Mr. George Coverdale had once taken a specimen at Shoeburyness, and another had been recorded in the *Entomologist's Monthly Magazine* as having been taken at Portland, a note being added that there were no fir-trees in the vicinity. Mr. Adkin thought it was extremely difficult to say that there were no fir-trees in any particular locality, as they were planted in most gardens and shrubberies. At Shoeburyness there were gardens which extended almost to the Saltings, and it was well known that the larvæ of *D. abietella* was found in very young trees. In addition to this, a number of ships carrying timber came almost daily to the River Thames, and he saw no reason why the insect should not be conveyed on board in the pupal state, emerge, and escape to the banks of the river; the capture of one or two solitary specimens away from localities where fir-trees were known to occur, did not in his opinion prove that the species did not feed on fir. Mr. Cooper mentioned that when at Shoeburyness, during the week, he had noticed several fir-trees.

Mr. R. Adkin also exhibited *Crambus dumetellus*, Hb., from Forres, with *C. pratellus*, L., and *C. dumetellus*, Hb., from Kent, and *C. ericellus*, Hb., from Scotch localities, for comparison, and called attention to the resemblance of the Forres *dumetellus* to the Kentish *pratellus*, which, in colour, size, and general appearance, they approached much more closely than they did to the Kentish *dumetellus*; but he pointed out that the form of the median white streak of the primaries showed them clearly to belong to this species.

Mr. A. Robinson exhibited five varieties of *Agrotis segetum*, Schiff., from Hunts, including one very pale male, one very dark female, and three males, showing variations in the spots and markings; also two varieties of *Agrotis exclamationis*, L., one

like the last figure in Newman's *British Moths*, and the other intermediate between this and the type. Mr. Tugwell remarked that both these species were very variable, but one of the examples of *segetum* shown was of a most unusual form, and would at first be taken to be a distinct species. There was, however, no doubt that it was a variety of the species in question, and although he had had a large experience of the species, he had not hitherto seen one so striking.

Mr. T. R. Billups exhibited the following Arachnidæ: *Heliophanus flavipes*, C. Koch, *Ballus depressus*, Walck, *Pachygnatha De Geeri*, Sund., with 40 other species; the three first-named species were taken by himself in his garden at Peckham. Mr. T. R. Billups also exhibited *Silvanus surinamensis*, L., and gave a short description of the habits and economy of this curious coleopteron.

Mr. W. Manger exhibited male and female specimens of *Odontolabrus cuviera*, and *Protocerus colossus* (?), from Darjeeling, India. With reference to the last-named insect, Mr. Billups expressed an opinion that it was certainly not the sugar-cane weevil, and he was of opinion that the species might be new to science.

Mr. Tugwell made some remarks, relative to a communication he had received from Mr. Pierce of Liverpool, as to the determination of species of Zygænidæ by an examination of the genital organs, and exhibited drawings, having especial reference to the specific difference of *Zygæna trifolii*, Esp., and *Z. meliloti*, Esp.; these drawings showing a most marked difference in the two insects in question.

MARCH 14th, 1889.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. A. Horne was elected a member.

Mr. Percy Russ exhibited a number of species of Lepidoptera from Sligo, including among others a distinct black-banded variety of *Amphidasys betularia*, L., dark grey forms of *Thera simulata*, Hb., black forms of *Agrotis segetum*, Schiff., 14 distinct varieties of *A. cursoria*, Bork., 18 varieties of *A. tritici*, L., pale and dark varieties of *A. vestigialis*, Hufn., a

green variety of *Plusia chrysitis*, L., and varieties of *Epunda lutulenta*, Bork., to the last of which Mr. Russ called special attention. Mr. Tutt remarked that the varieties of *E. lutulenta* appeared to be the form known as *luneburgensis*, Frr.

The Secretary read the following notes from Mr. T. D. A. Cockerell :—

“(1.) *Dermestes fasciatus*, Lec., type and aberration. *D. fasciatus* of the ordinary form is very frequent in Custer County, Colorado, but the example now shown is the only marked variation from the type that I have met with. This interesting specimen has the *left* elytron grey below the grey band—almost as grey as the band itself, and with not much black marbling. The *right* elytron below the band is black, with a trace of pale marbling, as in the usual form of the species. A symmetrical colouring in Coleoptera is by no means unknown—perhaps in this case, or even in most cases, it is due to partial atavism. Probably certain of the so-called ‘hemaphrodite’ specimens of Lepidoptera have a similar origin.

“(2.) *Pyrractomena borealis*, Randall. This specimen was obtained near Ula, Custer County, on the evening of June 12th. I was returning from town, and it was already dark, when I suddenly observed numerous bright points of light amongst the rank grass and herbage close to a creek. The lights appeared suddenly, lasted for from two to four seconds, and then went out. A search soon revealed specimens of the *Pyrractomena*, each seated on some blade of grass or flower-stalk, their caudal segments (which are of a pale yellow colour) glowing vividly from time to time, the light being emitted in undulations lasting for about a second each, and fading altogether, or occasionally leaving a faint glow, after the third or fourth undulation. This, in fact, is the ‘glow-worm’ of this country: the way in which the light is emitted is the chief point of interest in comparing it with the well-known *Lampyrus*, and interesting speculations might be made as to the precise nature and use of this luminosity. *Pyrractomena* is luminous here only for a short time—in the month of June.”

Mr. Tugwell read a paper, “Practical Hints on Breeding Macro-Lepidoptera.”

MARCH 28th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. J. E. Cutts, W. T. Sturt, and W. G. Macmurdo were elected members.

Mr. Hawes exhibited a variety of *Epinephela ianira*, L., taken near Hastings, Sussex, having additional spots on the primary wings; also two varieties of *Zygæna filipendulæ*, L., taken on the banks of the Great Northern Railway at Oakleigh Park, July, 1876. In both these specimens the central spots and upper spot of the outer pair were absent, and the inner pair of spots much contracted.

Mr. W. H. Tugwell exhibited examples of *Deilephila galii*, Schiff., and read the following notes:—

The unusual number of *Deilephila galii*, that occurred all over England last year, extending even to Ireland and Scotland, naturally re-opens the oft-repeated query as to their origin. The idea that has perhaps found the most favour is the so-called “blown over” theory, although there has never been any conclusive evidence given to prove it; but merely that it appeared the most feasible solution of the origin of this sudden and wonderful abundance of a large and showy species like *galii*. It may be remembered that in February last I exhibited a bred series of *D. galii*, three males and three females, as fine and large as any British-born specimens I had ever seen; when, to my surprise, after the meeting, one of our members, Mr. F. Oswald, came to me, and whilst admitting the beauty of my specimens, asked if they were not unusually small. On thinking this matter over afterwards, I too recollected that Mr. J. T. Williams had also told me how large the specimens were that he and Mr. Oswald had taken in St. Margaret’s Bay, so much so that Mr. Oswald had supposed them to be *S. ligustri*, L. This gave me the key to what I am now fully convinced is a positive fact, viz., that in nearly every case of captured moths of *D. galii* they are immigrants from the Continent, as I found on writing to all the captors of imagines in 1888 for measurement of their insects, they all agreed in being the large type that is found in France, but which type is never reared here in England from British-

fed larvæ. The cause of this is, I am fully convinced, the want of sunshine with us, our cold and wet weather, which weakens and dwarfs them, as the following table of figures will show pretty conclusively:—

Bred specimens from English larvæ, *i.e.*, found at large in this country. Liverpool:—Out of a large number bred one female only reached $3\frac{1}{8}$ inches, whilst the largest male was only $2\frac{10}{12}$ inches. From 106 bred by myself from Deal larvæ, the largest female measured $3\frac{1}{16}$ inches, the largest male measured $2\frac{5}{8}$ inches; average males, $2\frac{1}{2}$ inches; average female, $2\frac{3}{4}$ inches. From a number bred by Mr. J. A. Cooper from Essex larvæ, largest females, $2\frac{5}{8}$ inches; largest males, $2\frac{3}{8}$ inches.

Contrast these measurements with the following from caught imagines. The largest female caught by Mr. J. T. Williams measured $3\frac{3}{8}$ inches, and the smallest $3\frac{1}{8}$ inches; whilst the males measured $3\frac{1}{8}$ inches. From Kingsdown, Kent, ♀, $3\frac{1}{4}$ inches; from Aberdeen, ♀, $3\frac{1}{4}$ inches; from Plymouth, ♀, $3\frac{7}{16}$ inches; Dartford, Kent, ♂, 3 inches; Dublin, ♂, $2\frac{7}{10}$ inches.

All these caught examples agree with French types in my possession, *viz.*, females, $3\frac{3}{8}$ inches full; and males, $3\frac{1}{8}$ inches, and point most conclusively to their probable French origin, as not a single case of known bred English specimens ever reach the size of the caught moths, an average English ♀ being $2\frac{3}{4}$ inches; an average English ♂, $2\frac{1}{2}$ inches only.

Mr. Billups exhibited some very curious and beautiful forms of Exotic Orthoptera, Hemiptera, and Homoptera, amongst others, several species of *Acripexa* and *Necroscia* from Mongpo, Sikkim, taken at a height of 4,000 feet above the sea; a species of *Conocephalus* from Central America, imported into this country in Orchids, two species of Homoptera of the family Fulgoridæ, not yet determined, as also some strange-looking Hemiptera from the Island of Celebes, and one specimen of an Hemipteron, *Dalader acuticosta*, from Burmah. In addition, this gentleman also exhibited three very brilliant species of Phytophaga, or plant-eating beetles of the family *Sagridæ*: *S. buqueti*, Lac., from Java, *S. chrysochlora*, Lac., from Australasia, and *Sagra cæruleata*, Lac., from Madagascar.

Mr. W. West (Greenwich) exhibited a pair of *Calosoma sycophanta*, L., male and female, one of which he stated was captured in 1873 at Freshwater Bay, and the other in 1888 in Greenwich Park, Kent.

A microscopical exhibition was then given. Mr. Enock showing a series of slides illustrating the life-history of the Hessian Fly (*Cecidomyia destructor*, Say.) comprising eggs *in situ* on barley, larvæ and puparium *in situ* in stem of barley, exuviæ of pupa protruding from the puparium, male and female of the fly, also puparium and imago of the parasite *Semitellus destructor*, Say. Mr. West (Streatham), scales of Podura. Mr. Dennis, ova of *Polyommatus phlæas*, L., and ovum of *Lycæna ægon*, Schiff. Mr. R. Adkin, parts of the larvæ of *Orgyia antiqua*, L. Mr. Boutell, gizzard of House Cricket (*Acheta domestica*), and eggs of *Ligdia adustata*, Schiff.

APRIL 11th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. A. W. Dennis and G. E. Dench were elected members.

Mr. Jenner Weir exhibited some butterflies which he had desquamated by the "Waterhouse process"—*i.e.*, by first immersing them in alcohol, and then soaking them for a few minutes in *eau de Favelle* (solution of hypochlorite of potash). He remarked that although the scales of the wings were dissolved, yet the hairs remained unaffected, and that the green pattern in the wings of such butterflies as *Papilio lurlinus* and *Tirumula petiverana* retained its colour after desquamation; the markings were therefore not merely superficial on these insects. On the other hand, the green colour of the wings of *Ornithoptera arruana* appeared to be in the scales only, and was quite removed by the "Waterhouse process."

Mr. R. South exhibited several species of Lepidoptera, concerning which he made the following remarks:—

"*Plusia iota*, L. 1. Typical specimen; 2 and 3, var. *percontationis*, Treitschke, in which the metallic spots are united and form a gamma-like mark; 4, 5 and 6 show modification of metallic spots in the direction of evanescence. Complete

effacement of the metallic spots constitutes the form known as *inscripta*, Esp.

"*Plusia pulchrina*, Haw. (= v. *aureum*, Gr.). In the second specimen the metallic spots are confluent, and form a gamma-like mark. As far as I know this species, there is no tendency to effacement of metallic spots.

"Comparing *iota* with *pulchrina*, it will be seen that the former has a rosy tinge, whilst the latter is suffused with purple. These appear to be the best characters by which we can most readily separate one from the other. I have carefully examined the markings of each, but cannot find any better points of difference. In all my specimens of *pulchrina* (25 only) the stigmata are distinct, and there is a black abbreviated transverse basal line with metallic external edging, whereas in *iota* the stigmata are not distinct as a rule, and the basal line when present at all is ill-defined. The last example, however, in the series of *iota* exhibited this evening appears by its colour to be properly placed; but as it has the basal line well defined, and distinct stigmata, it may be *pulchrina*. Here, then, a problem presents itself, and I shall be glad if someone can tell me whether the specimen in question is *iota* with the markings of *pulchrina*, or an example of the latter with the coloration of *iota*.

"*Epunda lichenea*, Hubn. Of this species I exhibit two series, one of which is from Plymouth, and the other from Portland, both places on our S.W. coast. The specimens in the Plymouth series are fairly typical of the species, whilst the series from Portland is composed of small pale greenish-grey specimens, with but little if any of the pink or reddish tinge which characterises the type, and all the stigmata are conspicuous. Further, the secondaries are much paler in both sexes. The last example in each contingent are intermediate forms of opposite sexes, approximating to each other in coloration and markings, and so connecting their respective series.

"*Eubolia limitata*, Scop. Series from various English localities, the whole showing a considerable range of variation.

"*Melanippe galiata*, Hubn. Two short series bred from batches of ova deposited by different females. All the specimens of one set being much paler than the examples comprising the other set.

"*Triphæna comes*, Hubn. A specimen with ill-developed hind wings, colour and pattern normal, but only about one-third their proper size.

"*Bupalus piniaria*, L. The first specimen is typical of the Scotch and North English form of this species. The second specimen shows a preponderance of black, whilst that next in order has more than the normal amount of white. These three are from Forres, and were taken by Mr. Salvage last year (1888). The fourth and fifth specimens, from Forres and Durham respectively, have the apical patch and border of inner margin connected by a black bar which crosses the disc of the wing. Example No. 6 was taken by myself in Surrey. The light portions of the wings are of a pale yellowish colour, or perhaps it would be more correct to say that they are white, with a yellowish tint. This colour monopolises more than its proper share of the primaries, occupying as it does quite three-fourths of the wing. Another conspicuous feature in this specimen is the annular mark on the fore wings. The seventh specimen is from the New Forest, and also has more than its proper complement of yellow on primaries."

Mr. Wilkinson exhibited specimens of a few common species of scorpions, including male and female *Isometrus maculatus*, De Geer., from West Africa, and a female example of *Centrurus biaculeatus*, Lucas, from Cuba, and mentioned that they had been kept in spirits for four or five years, and when taken out for the purpose of mounting, were but little bleached.

Mr. W. White exhibited a series of typical *Arachnidæ*, chiefly exotic, including examples of *Galeodes*, *Scorpio Mygale*, and *Epeira*.

A letter from Mr. T. D. A. Cockerell, of Colorado, was read, referring to an article by Mr. Howard in the report of the Entomologist of the United States Department of Agriculture, in which was discussed, among other things, the food-plants of the larvæ of *Carpocapsa pomonella*, L., which, with the exception of one or two doubtful records, was confined to the natural order *Rosaceæ*. One of these doubtful records was in the *Entomologist's Monthly Mag.*, 1874, p. 13, where Mr. Barrett stated that Mr. W. West told him he

reared *C. pomonella* from a larva found feeding in a walnut. *C. pomonella* being one of the most important insect pests, it was of special interest to determine accurately the various points in its economy, and it would therefore be desirable for Mr. West to bring the specimen in question to one of the meetings of the Society, or take steps to ascertain precisely to what species it belonged. Mr. West stated that he would bring the specimen with others, also bred from walnut, to the next meeting ; and the matter stood over until then.

The following paper, by Mr. T. D. A. Cockerell, was read :—

On the Origin of the genus *Anthocharis*, Bdv. (= *Euchloe*, Hb.).—These delicate little butterflies, belonging to the genus *Anthocharis* of Boisduval, seem at first sight very aberrant members of the *Pieris* stock, with their one brood a year, narrow wings, and (in many species) orange apical patches on the forewings. Yet in examining their characters as compared with those of *Pieris*, I have been driven to the conclusion that *Anthocharis* is by no means an ancient genus—as genera go—and that it arose directly from an old *Pieris* stock, and that probably on the American continent. In stating the facts which have seemed to me to support such a view, it will be useful to review the peculiarities of the genus *Anthocharis*, and show how they may have arisen as offshoots from the stock from which the genus *Pieris* has also directly come.

Single-broodedness.—In Europe, *Pieris bryoniæ* of the Alps and far north is generally assumed to be the one-brooded ancestor of the double-brooded *P. napi* of the lowlands, and there is a tendency to assume that multiplication of the brood is a direct result of a warmer climate, and the idea of a single-brooded species arising from a double-brooded one seems not often to be entertained.

However, taking this same *napi* group in North America, we have still the assumed primitive type, *bryoniæ*, and likewise the forms *oleracea* and *venosa* to represent the European *napi*—so far the analogy is complete—but then we are met with what seems a strange anomaly. *Pieris virginiensis*, a delicate

pale-winged form, appears as a rare aberration in New York and Ontario, but actually as a spring-emerging one-brooded species in West Virginia—just exactly as if it were an *Anthocharis* in fact! From this I think we get a clue as to the origin of *Anthocharis*—it did not arise from a one-brooded arctic form like *P. bryoniæ*, but was rather a branch from a stem which was probably *even then* double-brooded—and that accounts for its pallor and delicacy of structure, as fits an insect of the temperate zone.

Orange-tips.—Those species of *Anthocharis* which I regard as coming nearest to the primitive type of the genus¹ do not present orange tips, but since these orange patches are so characteristic of many species it will hardly do to overlook them. In the first place they are developed in the males—which seems to show that they are of the nature of secondary sexual characters, and have perhaps been perpetuated as such from what was once a very rare variety or aberration. Secondly, it is well to remember that both *Pieris rapæ* and *P. venosa* have yellow aberrations, and even possibly (as I have argued in *Entomologist*, 1888, p. 112), came from yellow ancestors—and thirdly, in one species at least of *Anthocharis* (*A. cardamines*) there is an aberration (ab. *aureoflavescens*, see *Entomologist*, 1888, p. 189), in which yellow takes the place of orange.

Preparatory stages.—Dr. T. A. Chapman has an excellent paper (*Ent. Mo. Mag.*, 1888, p. 257), in which he compares the egg of *A. cardamines* with that of *Pieris rapæ*—pointing out that the egg of the former becomes orange, while that of the latter is never darker than a pale yellow—and further, that the eggs of *cardamines* are laid on the flower-heads. Having the eggs of no other *Pieris* at hand, he goes no further with his comparison, and it might be supposed that these differences were in some sense generic. But it is not so: *Pieris protodice* is very common in Custer Co., Colorado, and it lays its eggs profusely on *Arabis*, *Sisymbrium* and other cruciferous plants. These eggs are *orange*, and are nearly always laid *on the flower-heads* of *Arabis*, though also frequently on the stem and leaves of *Sisymbrium*.

Anthocharis ausonides (var. *coloradensis*, H. Edw.) flies here

¹ See also Darwin's *Descent of Man*, 2nd Ed., p. 312.

in May, and lays its eggs in the same situations as *P. protodice*. This year I sent Mr. W. H. Edwards a number of young larvæ, presumed to be those of *protodice*—and certainly seeming all to belong to the same species. But on the 1st of July he wrote: "Out of my *protodice* larvæ I got on the 30th (June) several pupæ (a ♂ *protodice* emerged from one of them some days later), and one of *Anth. ausonides*. I had not noticed any difference in the larvæ: I thought sometimes some were blacker than others—more black hairs." So it will be seen that in the earlier stages *P. protodice* and *A. ausonides* have the closest resemblance—the larvæ, in fact, are not distinguishable.

From these facts, I am inclined to believe that *Anthocharis ausonides* on the one hand, and *Pieris protodice* and its allies on the other, come nearest to the primitive stock from which both arose—and it is favourable to the idea of the antiquity of *ausonides* that it is the one species of its genus in America ranging to the far north—even Alaska. Assuming this, we are perhaps at liberty to construct a hypothetical *Protopieris*, and imagine a butterfly inhabiting the American continent ages ago, in shape somewhere between the modern *Pieris* and *Leucophasia* in markings—perhaps double-brooded—with a central black spot and dark apical patches to the fore wings, on the underside grey, marbling on the secondaries (for the green I take to be a subsequent arrangement of the yellow and black scales¹)—in colour, possibly saffron or brimstone yellow, though probably already white, or partly so.

Mr. Weir said that the paper was entirely speculative, but was full of suggestion. The assumption that the genus *Anthocharis* was an American one was not so carefully worked out as Mr. Scudder had argued out his view that *V. antiopa* originated in America. In his (Mr. Weir's) opinion there was not sufficient information on these matters to speculate upon the origin of the genus *Anthocharis*. There were so many of the group found in Europe that he did not see why we had not as much claim to it as America. Mr. South remarked with regard to the question of colour, if he had under-

¹ And the green veining of the underside of *Pieris napi* is of the same nature—in neither case is there really any green pigment.

stood Mr. Cockerell's paper rightly, the colour was first orange, then yellow, and afterwards white. His own idea was that species now red had passed through yellow and orange until ultimately they assumed the red we now see. *N. plantaginis*, in arctic and boreal regions had a white form known as *hospita*. Coming south we got a yellow form. Then with regard to *Gonepteryx rhamni*, the females in Europe were invariably pale, and much paler than the males. In Japan they were quite white; in China and India *rhamni* occurred of an orange yellow; south of Europe, North Asia and Asia Minor, it was still darker, and was known as *cleopatra*. Mr. Leech had in his collection an excellent series of grades between the ordinary *rhamni* and the variety *madurensis*, which has the whole of the primaries suffused with orange colour. The question was a most interesting one, and he was very glad Mr. Cockerell had taken it up. Mr. Tutt thought that if an insect had its origin in hot climates, the primitive types were generally of a much stronger colour than if it had its origin in arctic countries.

APRIL 25th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. A. Cant and R. Fortune were elected members.

Mr. J. A. Cooper exhibited a bred series of *Tæniocampa populeti*, Fb., the parent moth of which was said to have been taken at Rannoch, and he commented on their resemblance to the southern form of the species.

Mr. Fremlin exhibited varieties of *Vanessa urticæ*, L., picked from 3,500 specimens bred by him last year; in some the variation was in the shade of colour of the wings, in others in the size of the two spots on the superior wings; in the duplication of the spots and in many in the absence of the usual pigment. These last, Mr. Fremlin said, emerged with crumpled wings, and died within a few hours of emerging.

Mr. West (Greenwich) exhibited the specimens of *Carpocapsa pomonella*, L., referred to in Mr. Cockerell's note read at the last meeting. The specimen in question was unusually large, but undoubtedly of this species.

Mr. Rice exhibited eggs of the Blackbird (*Turdus merula*, L.), thirty clutches collected in the Leith Hill district, Surrey,

during the Easter holidays, each clutch being dissimilar in shade and markings, and showing variation from a whitish-blue spotted faintly with brown, to a ferruginous tint speckled so deeply that the ground colour was scarcely discernible; the commoner forms of bluish tinge, streaked, blotched, and sprinkled with light and reddish brown, were arranged side by side for comparison. A single specimen (the only one obtained from the nest) of exceedingly glossy surface, the ground colour of bright greenish-blue, cowled at the larger end by a rich rusty-brown verging on purple, the remainder of the egg being quite plain, was especially noticeable.

Mr. J. T. Carrington read a paper on "Spiders."

MAY 9th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Tugwell exhibited *Tephrosia biundularia*, Bk., showing a well-marked series of this single-brooded species from Tilgate Forest, Sussex, particularly a beautifully-banded ♂, figured, Plate I., fig. 4. Also *Tephrosia crepuscularia*, W.-V. spring and summer broods, and called attention to the fact that this was always a double-brooded insect—the spring brood appearing in March and April, and the summer brood in July; whilst *T. biundularia* had a single brood, appearing at the end of May to mid June. Although these two insects had a very strong general resemblance, he was convinced, after repeatedly breeding both insects, that they were two distinct species.

Mr. T. R. Billups exhibited a fine series of *Bembidium testaceum*, Duft., taken by himself at Chobham, Surrey, October, 1888. Also several living specimens of *Carabus auratus*, L., taken in the Borough Market, this being the seventh year in succession that he had captured this species in the market. Mr. Billups also exhibited a large quantity of a species of Oribatidæ, which he stated was causing an immense amount of mischief to corn-chandlers by feeding on the oats crushed for horses.

Mr. Billups, on behalf of Mr. Enock, exhibited a spider new to Britain, and stated that it was one of several captured by Col. Le Grice, R.A., at Folkestone, in May last. They had been submitted to the Rev. O. Pickard Cambridge, F.R.S.,

who identified them as *Pellenes tripunctatus*, or *P. crucigerus* (described under both names by Walckenaer). The habits of the male of this beautiful spider is to sit during the brightest sunshine on bits of chalk, which may be scattered about on sloping banks facing the south, the female being more retiring in her habits. The brilliant scarlet hairs which surround the four anterior eyes of the male make this spider the most strikingly beautiful of all the British Salticidæ. Plate I, figs. 10 and 11.

Mr. Carrington recorded having seen a Golden Oriole (*Oriolus galbula*, L.) in the Park at Westerham a few days previously; he had frequently seen the species in Spain and North Africa, but had not before seen it in England, and had never heard of it being seen so near London. Wrynecks (*Jynx torquilla*, L.) were very abundant, but the swallows appeared to be later.

Mr. Billups said that during the afternoon he had seen a flight of some seventy or eighty swallows which were passing over London Bridge, flying very high, and appeared to be following in the wake of a heavy thunderstorm which had previously passed over London.

MAY 23rd, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Billups exhibited a series of *Banchus variegator*, Fab., bred from *Panolis piniperda*, Panz., by Mr. Helps, and a large female of *Ophion luteum*, Fab., bred from *Dicranura vinula*, L., by Mr. Waller.

Mr. R. South exhibited *Hyssipetes sordidata*, Fab., (= *elutata*, Hub.), v. *fusco-undata*, Don., and v. *infuscata*, Staud.; and read the following notes:—

“The series of *Hyssipetes sordidata* exhibited this evening comprises examples of the species from various English and Scotch localities. This is certainly a common insect, but as it is also most variable as regards colour and ornamentation, it must commend itself to all who are interested in variation. Before, however, aberration is discussed, I would draw your attention to specimens bred from larvæ collected in North Devon in 1881. The examples in the first three rows were bred from larvæ found feeding on bilberry in a small wood

near the sea, and they emerged in June; whilst those in the fourth row were bred from larvæ taken on willows, which grew on the upper border of said wood and in the adjacent hedgerows; these attained the perfect state in July. At the time the bilberry-fed specimens were leaving the pupa in my breeding cages, the insect was to be taken in numbers as they flew, just before dusk, over the bilberry. When the willow-fed specimens first came out in my cages (July 13th), the bilberry wild examples were getting worn, but the willows continued to yield fine *sordidata* up to the end of July.

"It will be observed that specimens bred from bilberry are much smaller than the examples bred from willow. I regret to say that I did not carefully compare the respective larvæ.

"As regards aberration of the species, it will be seen that I have divided the North Devon series into twenty-four detachments of vars. Placed as I have put them, each form appears to have aberrant character sufficiently well defined to entitle it to a varietal name, but arranged in the way I have a series in my cabinet, there is no clear line of demarcation between the various forms. Two forms have been named in the past, *i.e.*, *fusco-undata*, Don., and *infuscata*, Staud. The fore-wings of the former have a reddish ground colour, and are traversed by a black fascia. The last-named variety is more or less suffused with fuscous. Hübner figures four specimens which appear to be modifications of the type—that is *sordidata*, Fab.; these are numbered 224, 382, 384, and 385. His figures 381 and 383 represent specimens of the *fusco-undata* forms, the latter tending towards *infuscata*, Staud.

"It is curious to note that the *infuscata* form does not appear to occur among the North Devon bilberry specimens, neither is there, as far as I could find, anything quite similar to the *fusco-undata* form among the willow examples in that place. I examined large numbers of each, but only retained those specimens which served to illustrate the range of variation of the species in that particular district. Among the moorland examples of *sordidata* from the neighbourhood of Barnsley are examples of the *infuscata* form, but compared with specimens from South England all the examples I have seen from that district are much darker in tint. The specimens from

Seal Chart, near Sevenoaks, also bred from bilberry, are pretty much like some of those from North Devon bred from larvæ found on bilberry.

Mr. Tugwell exhibited a series of a rich brown and banded form of *Acidalia aversata*, L., bred from a batch of ova from Boxhill. The female parent alone was seen, and this was the strongly-banded grey type; curiously, not a single one of the brood was of this form, the rich brown and the var. *spoliata* of Staud., alone resulting, and in about equal numbers—a strong refutation of the idea that the ♀ parent gives a preponderance of character to the brood. In this case not a single one followed the mother-type.

Mr. Billups exhibited *Lithocharis picea*, Kr., from Lewisham, and remarked that only two specimens had previously been recorded, one from Bexley Wood and the other from Darenth Wood, Kent; whereas it had now occurred in considerable numbers.

Mr. White read a paper on “Observation *versus* Collecting.”

JUNE 13th, 1889.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. Wellman exhibited bred specimens of *Macroglossa fuciformis*, L., showing the greenish coloured scales on the transparent part of the wings.

Mr. Robson exhibited examples of *Sesia formiciformis*, Esp., with yellow bands.

Mr. South exhibited *Cidaria truncata*, Hufn., and *C. immanata*, Haw., and contributed the following notes on the synonymy and variation of those species.—“In *truncata* we have a species which has been honoured with no less than eight names, and has been placed in half as many genera, not including *Phalæna* and *Geometra*, which were rather tribes or divisions than genera.

“*Phalæna truncata*, Hufn. Berl. Mag. iv. 602, 625 (1769); Rott. Naturf. xi. 78. (var.) *Phalæna centum-notata*, Schulz. Naturf. vi. p. 93, pl. iv. fig. 4 (1775); Fab. Gen. 290. *Geometra russata*, Wein. Verz. p. 113, n. 18 (1776); Bork. Eur. Schmett. v. 405, 200; Hübn. Geom. fig. 305. *Dystroma russata*, Hübn. Verz. Schmett. 333, 3210. (var.) *Geometra comma-notata*, Haw. Lep. Brit. p. 325. (var.) *Geometra perfusca*, Haw.

l.c. *Cidaria russata*, Treit. Schmett. vi. 2, 189, 27; Dup. Lep.viii. 193, pl. 193, fig. 4; Boisd. Ind. 214, 1765. (var.) *Polyphasia concinnata*, Steph. Ill. Brit. Est. Haust. iii. p. 229, 6. *P. centum-notata*, Steph. l.c. p. 230. (var.) *P. saturata*, Steph. l.c. p. 231. *Larentia russaria*, Herr.-Schaff. Eur. Schmett. iii. 172, 189; Lah. Gem. p. 137.

"Seeing how variable the species is, this multiplicity of trivial names is hardly matter for surprise. Although considered distinct species in comparatively recent times, but few, if any, entomologists of the present day will be inclined to claim specific rank for the forms now so generally admitted to be aberrations of *C. truncata*. *Centumnotata* has the central area of the primaries white, whilst in *commenotata* the central area is fulvous, and in *saturata* the whole wing is suffused with fuscous, but the central area is paler; all these are modifications of the type form, and there are intermediates in all stages connecting one with the other. Hubner's fig. 305, for instance, which by the way Guenée considers the type of *russata*, represents a specimen which is neither exactly typical or yet *centum-notata*, as it has broad bright fulvous bands; this, however, may be an over-coloured figure, as are many of Hubner's figures.

"In the var. *perfuscata*, however, we have a form of *truncata* which exhibits some aberration from the type in marking as well as colour. The basal two-thirds of primaries are blackish, the external limit being well defined by a white toothed line; there are also two short white lines on the inner margin near the base. Secondaries fuscous grey, with a pale central transverse line. Guenée's fig. 2, pl. 17 (*C. russata* var.), is like *immanata*, but is not a good representation of anything I have seen. From his description it is evident, however, that *perfuscata*, Haw., is the insect Guenée refers to. Hubner's fig. 445 and Wood's 580 represent modifications of this form; the latter is like the three upper examples in the series of *perfuscata* you will find among the specimens exhibited this evening.

"*Concinnata*, Steph., applies to the Arran form of *truncata*. In this form the blackish basal two-thirds of *perfuscata* is broken up, by the interposition of a transverse sub-basal fulvous white-edged band, into a blackish basal patch and a blackish central fascia; this last is further adorned with white

spots and dashes, and has its outer edge bordered by a white line, which sometimes is broadly expanded just below the costa; external third with the fulvous band well defined.

"*Cidaria immanata*—*Geometra immanata*, Haw., p. 323. *Polyphasia immanata*, Steph., Ill. Brit. Haust., iii., p. 228; Wood, fig. 573. (var.) *Geometra marmorata*, Haw., p. 324. *Polyphasia amoenata*, Steph., Ill. Brit. Haust., iii., p. 228; Wood, fig. 574.

"This insect is not so deeply involved in the synonymic web as that previously considered, but I have not tabulated the synonymy, as I thought I could deal better with it in another way

"Dr. Staudinger (Stett. Ent. Zeit., 1857, p. 252) seems at one time to have incorporated *C. immanata* with *russata*, and treated the forms of each as varieties of one species, *i.e.*, the *truncata* of Hufnagel. This name had been previously adopted by Lederer in his "Versuch die europäishen Spanner," published in 1853. Subsequently, however, we find that Dr. Staudinger, in his "Catalog," places *immanata*, Haw., apart from *truncata*, and condenses into four forms of *immanata* the eleven aberrations he had previously characterised as forms of *truncata*. The following table will, I think, show this :—

Immanata.

Russata var. *d.* Alis anticis albidis fusco-mixtis; basi fasciaque media fuscis ♂ ♀.
 „ „ *g.* Al. ant. albidis ochraceo-mixtis; basi fasciaque media ochraceis ♂ ♀.

Marmorata.

Russata var. *b.* Al. ant. albidis, lineolis undulatis nigris ♂ ♀.
 „ „ *f.* Al. ant. fuscis, extus albicantibus ♂.
 „ „ *i.* Al. ant. lutescentibus lineolis obscurioribus ♂.

Thingvallata.

Russata var. *c.* Al. ant. albidis basi fasciaque media aterrimis ♂ ♀.

Unicolorata.

Russata var. *a.* Al. ant. albido-cinereis ♂ ♀.
 „ „ *e.* Al. ant. concoloribus fuscis ♂.
 „ „ *h.* Al. ant. ochraceis ♂.
 „ „ *l.* Al. ant. nigricantibus ♀.

"Millière (Ionographie et Description de Chenilles et Lépidoptèra, 1869) figures as two vars. of *immanata*, two forms of *truncata*, thus his varieties of *C. russata* on pl. 5 are forms of *immanata*, fig. 11 being a well marked typical form, and fig. 12 the var. *thingvallata*, Staud. Then again—

Plate iii. fig. 7, *immanata* var. = *perfuscata*, Haw.

„ „ 8, *immanata* var. = *comma-notata*, Haw.

"The specimen which Stephens describes and Wood figures as *amoenata*, was taken in Devonshire, but I have nothing among my Devonshire examples which agrees with either description or figure. It is certainly a modification of the *marmorata* form of *immanata*. The only insect I possess at all like *amoenata* is one from Lewis, which you will find numbered 3 in the series from the Hebrides.

"*Thingvallata*, which has white primaries with black basal patch and central fascia, is a modification of the type form. I have no example of it, nor have I seen a British example; but Mr. Leech has specimens from Japan, and I have seen Dr. Staudinger's specimens from Iceland. The upper specimen of the two from York varies in the direction of *thingvallata*.

"The *unicolorata* form of Staudinger appears to be somewhat protean in character, as it may be ashy-white, fuscous, ochreous, or blackish. Millière figures (Icon., pl. v., fig. 10) a curious looking aberration which Dr. Staudinger includes with *unicolorata*, but I can make nothing of it; the markings are those of *immanata* in character, but they are pale olive-green in colour.

"The thirteen specimens from the mainland of Shetland are of an almost unicolorous form, but those from Unst are neither good *immanata* nor *marmorata*, though possessing the characters of both. I believe that this Shetland form is *immanata* var. *pythonissata* (Millière, Icon., plate iii., fig. 9). Some of my specimens from Unst agree well with this figure, which I may add represents one of three specimens sent to Millière by Doubleday, who bred them from larvæ."

Mr. E. Step exhibited *Testacella haliotideæ*, Drap., from Lewisham, and *Helix lapicida*, L., from Langley Bottom, Epsom.

JUNE 27th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Billups exhibited specimens of the very beautiful *Eulophus damicornis*, Kirby, of the family Cynipidæ, Lat., bred from pupæ attached to the leaves of lime-trees from Oxshot, Surrey, taken by Mr. Adkin. Mr. Billups said this species was most probably parasitic upon the larva of some species of Micro-Lepidoptera.

Mr. Wellman exhibited *Penthina pruniana*, Hb., with the usual central dark half of the superior wings so largely suffused with pale grey that it had almost entirely disappeared (Plate I., fig. 7).

Mr. Dennis exhibited a variety of *Argynnis selene*, Schiff., taken in Ashdown Forest. The black markings of the specimen were enlarged, and formed a somewhat broken band across the wing.

Mr. Waller exhibited a fawn-coloured variety of *Argynnis euphrosyne*, L., taken at Box Hill, Surrey.

Mr. Billups exhibited a specimen of the rare Hemipteron *Sehirus dubius*, Scop., taken by Mr. Carrington at Horsley, Surrey, a new locality for this species, as hitherto it had only been recorded from the Isle of Wight, Portland, and Pangbourne. Also a series of *Corymbites quercus* var. *ochropterus*, Steph., taken at Armagh, Ireland, in May of this year by the Rev. W. F. Johnson.

Mr. Billups also exhibited galls on the ground ivy (*Nepeta glechoma*, Benth.), and the gall-flies bred from the same, viz., *Callimome glechomæ*, Mayr. For these galls he was indebted to Mr. Carrington, who found them in the neighbourhood of Westerham, in May last. Mr. Billups also exhibited galls on the yellow bedstraw (*Galium verum*, L.), and their makers *Callimome galii*, Boh. These galls were found in great abundance by Mr. Billups on the occasion of the Society's visit to Horsley on the 20th of the present month.

Mr. Carrington exhibited a large and curious cluster of dead flies attached to a sallow twig, part of a bush overhanging a lake in the neighbourhood of Condover, near Shrewsbury. They were found by Mrs. Close, of Condover

Hall, who sent the mass of flies to the editor of the *Field* newspaper for identification. Mr. Billups said that the species was *Atherix ibis*, F., one of the family *Leptidæ*, and that the cluster consisted of female specimens only, it being the usual habit of the females of this species to deposit their ova on a branch overhanging water, and then almost immediately to die; these are followed by others which conduct themselves in a similar manner, and so form the pear-shaped mass which sometimes numbers many hundreds. The larvæ hatch from these ova, and drop into the water, where they undergo their metamorphoses.

JULY 11th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Billups exhibited specimens of the curious Braconid, *Orgilus obscurator*, N., bred by Mr. Adkin from a lepidopterous larvæ feeding in the shoots of willow, from Derry, Ireland, but the host was not known. Also specimens of *Apanteles ruficrus*, Hal., showing the clusters of cocoons and remains of its host, *Diloba cæruleocephala*, L., from the neighbourhood of Horsley, Surrey, the larvæ being collected by Mr. South. The exhibitor remarked that this common and gregarious parasite had been reared from widely different hosts, Mr. Bignell having bred it from *Leucania littoralis*, Curt., and *Spilosoma menthrasti*; Mr. Raynor had bred it from *Leucania pallens*, L., and Mr. Fitch from *Collix sparsata*, Hb.; while other gentlemen had bred it from *Agrotis præcox*, L., and Mr. Porritt had reared it from the same host as at present mentioned, *Diloba cæruleocephala*, L.

Mr. Billups again referred to the exhibition by Mr. Carrington at the previous meeting of the very curious cluster of dead flies (*Atherix ibis*); and now exhibited two dead flies with large clusters of minute pupæ attached, from which had been bred another species of Hymenopterous parasite of the genus *Encyrtus*; at the previous meeting *Antæon alorus*, Walk., was found in the cluster of dead flies; but since then the tiny *Encyrtus* must have emerged in myriads, judging from the enormous number of pupa cases found.

Mr. Tugwell exhibited stems of *Salix repens*, L., with what appeared to be galls closely resembling in appearance the berries of *Vaccinium*. From the galls Mr. Billups subsequently bred a species of *Tenthredinidæ*, viz., *Nematus viminalis*, L.

Mr. J. A. Clark exhibited specimens of *Retinia resinella*, L., from Forres.

Mr. Turner exhibited a variety of *Melanippe fluctuata*, L., the only markings being a small dark basal patch, a central small dark ocellus, and a dash on apical costal margin; ground colour of wing white, with faint grey shading. The usual central fascia wanting (Plate I., fig. 8).

Mr. Rice exhibited nest of the sparrow hawk (*Accipiter nisus*, L.), containing six eggs, from Leith Hill; also several clutches of eggs of the nightjar (*Caprimulgus europæus*, L.), showing variety of coloration which was thought to be for protective purposes.

Mr. J. J. Weir exhibited leaves of *Urtica dioica*, L., with a number of dead flies attached, which, he thought, had perished by the attack of a fungus; the leaves of the nettles on the downs near Lewes often had as many as six or seven flies attached to a single leaf.

Mr. Billups expressed an opinion that the flies had died through the attack of some internal parasite.

Mr. Step exhibited a tawny owl (*Syrnium aluco*, L.), from Leith Hill, Surrey.

JULY 25th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. H. Moore exhibited a series of nests of *Pelopæus humilis*, L., with larvæ, pupæ, and imagines, and remarked that the insect was tolerably common in Bermuda, building its clay cells in clusters of from six to nine, under the eaves of houses, in cuttings, and at the roots of trees; one of the nests seemed to have been built upon a root fibre in a pensile condition. The cells were formed of the clay found in the immediate vicinity; that from the Walsingham caves was constructed of a tenacious red clay; others of sandy clay (the commonest met with), and they were so brittle that only one in every five could be detached in a perfect condition. A good specimen made of black mud had been built on a white-

washed wall. The cells, which had an average depth of $1\frac{1}{4}$ inches, were built up of layers in concentric circles, the egg then being laid at the bottom, and the cell, filled up with spiders, about ten in number, is then closed, and the whole surface daubed over with mud, so that it should not be too attractive in appearance. The Rev. J. G. Wood, in describing *P. fistularia*, Gr., a closely allied species, had stated that instead of choosing the plumpest kinds of spiders for her young, this wasp did just the opposite. *P. humilis* seemed to take the first that comes; the contents of a cell exhibited comprised three *Epeiridæ*, five *Salticidæ*, and two *Linyphiidæ*. The larvæ are full fed in the autumn, and pass the winter in the larval state from November to March; they turn into pupæ in the spring, and emerge about June. Mr. H. Moore made further remarks with regard to the development of the pigment in the pupæ, which he stated seemed to be much slower in our climate, live specimens under observation being susceptible to every change of temperature, a warm day making a considerable difference in their metamorphosis.

Mr. Billups exhibited six of the seven species of social wasps, of the genus *Vespa*, indigenous to this country, namely *V. crabro*, L., *V. vulgaris*, L., *V. germanica*, Fab., *V. rufa*, L., *V. sylvestris*, Scop., and *V. norvegica*, Fab., the other species being the rare *V. arborea*, Smith.

Mr. R. South exhibited a remarkable specimen of *Argynnus adippe*, L. This curious insect was of a pale fawn colour, and the macular ornamentation hyaline, instead of the usual black. On the under surface of the secondaries the silver spots and red dots were quite normal.

Mr. Auld exhibited three specimens of *Callimorpha hera*, L., var. *lutescens*, Staud., bred from ova obtained from an example of the variety taken in Devon, 1888.

Mr. J. T. Williams exhibited an example of *Arctia caia*, L., with the red of the secondary wings replaced by an orange colour.

Mr. Rice exhibited a nest and five eggs of the wood-wren, (*Phylloscopus sibilatrix*, Bechst) from Sevenoaks, Kent, taken July 17th. The nest, instead of being semi-domed, was cup-shaped, and was built in standing grass about six inches from the ground. The eggs were normal.

AUGUST 8th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. T. R. Billups exhibited a female specimen of *Bracon roberti*, Wesm., taken in his garden at Peckham; a series of *Ascogaster instabilis*, Wesm., *A. varipes*, Wesm. (both sexes being represented) from Derry; also galls on *Salix herbacea*, L., and their maker *Nematus herbaceæ*, Cam., from Aberdeen.

Mr. Dawson exhibited a specimen of *Polyommatus phlæas*, L., var. *schmidtii*, Gerhard, taken at Plumstead; an example of *Deilephila livornica*, Esp., from Plymouth, 1888; and a variety of *Tæniocampa incerta*, Hufn., taken at Plumstead.

Mr. Carrington, referring to the variety *schmidtii*, said he only knew of two or three having been taken during the last ten or fifteen years. Mr. Tugwell said, however, that he could not agree with this statement; he thought that in nearly all the principal collections there were, if not the variety itself, forms of *phlæas* closely approaching it.

Mr. E. Joy exhibited a variety of *Epinephela hyperanthes*, L., with the whole of the spots on the under surface much enlarged.

Mr. Dennis exhibited specimens of *Bryophila perla*, Fb., including several yellow examples, and one having the superior wings almost entirely suffused with black.

Mr. R. Adkin exhibited a specimen of *Chærocampa porcellus*, L., together with its cocoon, and said that the larva from which it was bred was taken at Eastbourne in the previous autumn, and being of small size was placed in a leno bag with a quantity of *Galium* to feed up; when next observed it was found to have formed a pupal chamber in one of the folds of the leno by lining it with a substance resembling a film of gelatine, slightly flexible to the touch and apparently of a damp resisting nature, and he was of opinion that it represented the lining of the earthen cell made by the larva when allowed to pupate under natural conditions, but which was of so delicate a structure as to prevent its being detected when a pupa was removed from the earth. He further said that this pupa had been allowed to remain in its cocoon without other protection from the air until the imago emerged, after

which it was found that the gelatinous lining had almost completely disappeared.

The Secretary read the following note from Mr. Cockerell (Colorado):—

“*Bees and Poppy-flowers.*—In June of the present year I picked some flowers of the prickly white poppy (*Argemone platyceras*, Link. and Otto) which is so common about here. I noticed some little bees on the flowers, but did not remove them. I carried those flowers about in my hand for at least half an hour, and then, looking at them, found the bees still there. They seemed quite stupified, and when knocked off fell down and were unable to fly. Evidently the poppy alkaloids had quite overcome them, which was rather surprising to me, as I had no idea bees would be affected in this way. *Papaver somniferum*, one would suppose, ought to have even greater effect, if visited by bees, and observations on this point would be easy to make. Does any member know if such have been recorded?”

AUGUST 22nd, 1889.

J. T. CARRINGTON, Esq., F.L.S., *Vice-President*, in the Chair.

Mr. Skinner exhibited a bleached example of *Epinephele ianira*, L., taken at Box Hill, Surrey.

Mr. Carrington, on behalf of Mr. G. A. Lewcock, exhibited some 300 specimens of Coleoptera taken during the season, comprising some of the larger aquatic species, a few Donaciæ, Malacoderma, Heteromera, etc.; mainly from Chattenden, Epping, Woking, and Farnham.

Mr. Carrington remarked that during the week he had been to Shoeburyness, and while there he had noticed that the firing of the 110-ton gun appeared to have no effect on Lepidoptera; *Polyommatus phlæas*, L., *Vanessa urticæ*, L., and other species did not seem to be disturbed by the vibration of the air, although it was so intense as to break windows at a distance of two miles.

SEPTEMBER 12th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Jenner Weir exhibited desquamated upper wings of the male of *Argynnis paphia*, L. (Plate I., figs. 5 and 6), in

order to show that the apparent thickening of the median nervules and submedian nervure, in that sex of the species, was due to the dense covering of broad scales, bent over and concealing some very narrow clavate black scales, or androconia; these appeared to be of a different substance to the ordinary scales of the wings, so that when, by the Waterhouse process, he had denuded the wings of the ordinary scales the androconia remained intact, and were removed by the use of the camel's hair brush, considerable friction being necessary. Mr. Jenner Weir remarked that he had been induced to bring this matter before the Society, because he found that some British Entomologists appeared to think that in the restricted genus *Argynnis* there was a real dilatation of some of the median nervules, and occasionally of the submedian nervure, but a reference to Mr. Scudder's work on the "Butterflies of the Eastern United States and Canada," and to the "Exotische Schmetterlinge von Dr. Staudinger und Dr. Schatz," would show that neither the American nor German Entomologists named had fallen into such an error.

Mr. Croker exhibited dark forms of *Gnophos obscuraria*, Hb., from the New Forest, and a specimen of *Tæniocampa gothica*, L., closely approaching var. *gothicina*, H.-S., taken at West Wickham Wood. Mr. C. Fenn mentioned having taken a similar variety at Lewisham.

Mr. Turner exhibited a pinkish variety of *Hypsipetes sordidata*, Fb., also dark forms of *Boarmia gemmaria*, Brahm., from Ashdown Forest, and specimens of *Cabera rotundaria*, Haw.

Considerable discussion took place as to whether the last-named was a distinct species or a variety of *Cabera pusaria*, L., in the course of which Mr. R. Adkin referred to an exhibit by Mr. Atmore at the Society's Exhibition in 1888 of a long series of *C. pusaria*, in which were two specimens having the primaries on one side of the body approaching *C. rotundaria*, and on the other typical *pusaria*; these were bred from larvæ taken in 1886.

SEPTEMBER 26th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. Tugwell exhibited *Peronia hastiana*, L., vars.; bred during August, 1889, from larva collected at Braemar, Aberdeenshire, showing considerable variation; the form with almost black superior wings, with broad white or cream-coloured central dash, or vitta (and in a few cases bordered with red), was largely represented, 50 per cent. being bred of this type.

Mr. R. Adkin exhibited a series of *Hypermercia augustana*, Hb., bred from larvæ found feeding in shoots of willow collected in Co. Derry, Ireland. The specimens showed considerable variation, some having the ground colour of the primaries silvery and the usual reddish brown central fascia and costal patch intensified; while in others the colour of these markings was almost entirely replaced by dull grey.

Mr. Jenner Weir exhibited chrysalides of *Pieris napi*, L., to show that although their colour was very much affected by the environment of the caterpillar at the time of their metamorphosis, yet in no way did their colour approximate to that of their surroundings. They were all the produce of one female of the species; those that had changed to chrysalides in an ordinary breeding cage with perforated zinc sides were of a dull cream colour with black spots, and those that had metamorphosed in a tinned gentle-box, with the usual perforations at the top, were of a beautiful apple green with black spots. They had all been reared from the egg and fed up in the breeding cage; and those that had become chrysalides in the gentle-box had been placed there a few days before they changed.

Mr. Carrington remarked that in the gentle-box there would be an absence of light, while in the breeding cage there would be considerable light; it might, therefore, be that the brightness of the surroundings would be more favourable to the bright colour of the pupa in the breeding cage. Another question was, how much individual control or will power there was to cause these changes? When at the Aquarium at Westminster, he had observed that if flat fish sent from the coast with very bright spots upon them, were placed in a tank with a clean

gravelly bottom, the spots remained; but if placed in a tank with a sandy bottom the whole of the fish lost the spots within twenty-four hours. If put back into the tank with the gravelly bottom the spots reappeared within the same period. This was no doubt protective, arising through natural selection. Mr. Tugwell expressed an opinion that if the green pupæ were placed in a strong light they would probably lose their colour.

Mr. Turner exhibited a varied series of *Triphæna pronuba*, L., and said he was in doubt as to which was the var. *innuba*, Tr., but that the variation of *T. pronuba* was similar to that of *T. comes*, Hb.

Mr. A. E. Hall sent for exhibition a jar containing a large quantity of macaroni, which had been placed on one side for culinary purposes. On being opened for use it was found to be infested with a host of minute beetles. Mr. Billups said the little pest was *Anobium testaceum*, L., a coleopteron, which attacked almost everything eatable, even cayenne pepper and cloves.

OCTOBER 10th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. J. Jenner Weir again exhibited the green-coloured pupæ of *Pieris napi*, L., and said that at the last meeting he exhibited chrysalides of *Pieris napi*, the metamorphosis of which had taken place under the conditions then stated. It was then thought by some of the members that the apple-green specimens would, if placed in a strong light, lose their colour. He now exhibited the same chrysalides which had been exposed for weeks close to the glass of his greenhouse, in the direct rays of the sun, and it would be seen that not the slightest fading of the green colour had taken place.

Mr. R. South exhibited a curious specimen of *Luperina testacea*, Hb., bred from a pupa found at root of *Silene* at Eastbourne, and an example of a *Luperina*, which seemed to be referable to *L. nickerlii*, Freyer.; the latter received from Mr. Baxter, who had taken it at St. Anne's-on-Sea, near Preston. Mr. South said that *nickerlii* was probably only a variety of *L. testacea*, and the Lancashire specimen appeared to be intermediate between typical *nickerlii* and *testacea* var. *guenéei*, Dbld.

Mr. South also exhibited *Triphæna comes*, Hb., from Dundee and Perth, and made the following observations on the markings of the secondary wings:—

“The central spot on under surface of secondaries is generally less conspicuous than above, and often entirely absent. In specimen No. 1, for instance, the spot on the upper surface is large and well defined, but beneath it is very small. In Nos. 3 and 4 the spot is absent below, whilst in No. 5 it is as large as on the underside of No. 2, but is hardly visible on the upper surface.

“Another phase in the variation of this species is illustrated by No. 5, and here again it is the ornamentation of the secondaries which is aberrant. In the black band preceding the outer margin we have a character which is subject to modification in several ways, but two only of these will be referred to, *i.e.*, A. Disruption; B. Abbreviation. In No. 5 we see the band is distinctly separated at a point where it is intersected by the first median nervule. In the two examples above, the band exhibits a tendency to break up at the same point. (The band in No. 3 is on one side apparently intersected by the three median and second subcostal nervules, but this is really due to abrasion.)

“Again, the band is usually broad towards the costa, where it unites with a black or blackish costal streak; but in No. 6 we see the band is contracted beyond the first subcostal nervule, and there is no costal streak for it to unite with.”

Mr. South, referring to Mr. Turner's query at the last meeting as to *Triphæna pronuba*, L., and its var. *innuba*, Tr., stated that in the variety the wings and thorax were concolorous.

Mr. J. A. Cooper exhibited a series of *Deilephila galii*, Schiff., bred this season from larvæ found in Suffolk and Essex; and stated that although he had this autumn again looked for larvæ, he had not been able to find any. Mr. Tugwell remarked that his experience coincided with that of Mr. Cooper as to the total absence of the larvæ even in those places where it had been abundant the previous year.

Mr. Wellman exhibited examples of *Gnophos obscuraria*, Hb., from Lewes. Mr. Weir having stated that this pale form of the species only seemed to occur at Lewes, Mr. Tutt

remarked that he once took a similar specimen at Folkestone.

Mr. Oldham exhibited *Larentia didymata*, L., *Carsia paludata*, Thnb., *Celæna haworthii*, Curt., and *Miana literosa*, Haw., from Carrington Moss, Cheshire, which he stated would soon be a thing of the past, as there was an intention to cultivate it.

Mr. R. Adkin exhibited examples of *Boarmia abietaria*, Hb., from Boxhill and the New Forest; with regard to the latter, he remarked that the larvæ from which they were bred were beaten from Scotch fir (*Pinus sylvestris*, L.); they, however, did not thrive upon it in confinement, but took readily to birch (*Betula*) when given to them, and ultimately fed up entirely upon it.

Mr. Frohawk exhibited *Calopteryx virgo*, L., light and dark forms of the male, from the New Forest; and also *C. splendens*, Harr. (male and female), from Ipswich.

Mr. T. R. Billups exhibited a living example of the mole cricket (*Gryllotalpa vulgaris*, Latr.), and read notes relative thereto.

Mr. A. E. Cook exhibited two specimens of the mole (*Talpa europæa*, L.), from Essex, one of them being an albino.

Mr. Cooper remarked that he once found an albino variety of the mole in Finsbury Park; and the variety seemed to be fairly plentiful in Norfolk, as during the last two years he had several offered to him from that county.

Mr. C. A. Briggs exhibited an example of *Coregonus oxyrhynchus*, L., a fish occasionally taken in English tidal waters, and in the same genus as the British Pollan (*C. pollan*, Thompson) and the Vendace (*C. vandesius*, Richardson).

OCTOBER 24th, 1889,

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. W. Mansbridge, V. Gerrard, C. H. Collings, H. C. Pickard-Cambridge, J. T. Winkworth, C. J. Wainwright, and A. Ford were elected members.

Mr. Fremlin exhibited a specimen of *Vanessa antiopa*, L., taken near Maidstone on the 12th instant, and remarked that

two were also taken in the same district in 1847, and one in 1881.

Mr. Mera exhibited varieties of *Arctia caia*, L., and said they were a second brood of the species.

Mr. Carrington remarked that they varied much in size and markings from the typical form of *A. caia*, and in his experience this was generally so when a second brood was reared.

Mr. Adye exhibited two specimens of *Laphygma exigua*, Hb., taken by Mr. Druitt, of Christchurch.

Mr. Weir exhibited a specimen of *Pieris rapæ*, L., taken by him during the week, and commented on the late appearance of the specimen.

Mr. Winkley stated that he had noticed an example of the same species three or four days previously.

Mr. W. West (Streatham) exhibited *Gordius aquaticus*, L., and read the following notes:—

“The specimen was found in water at Interlaken, in Switzerland. It belongs to the class Entozoa—sub-class Cœlmintha, order Nematoda, family Gordiidæ. It takes up a temporary residence in the bodies of certain insects, principally beetles; the ova, which are oval, are swallowed by the insect, and possess filaments which prevent them passing out until developed. The longitudinal diameter of the egg is about $\frac{1}{500}$ of an inch, the girth being about $\frac{1}{600}$. When fully developed they leave the insect in order to deposit their ova, which are ejected in long chains. The body is jointed, and when dried up is capable of resuscitation with a little water. They vary in length, the specimen shown being when stretched out $19\frac{1}{2}$ inches. The sexes are easily separable, the tail of the male being bifid, while that of the female is simple and rounded; they are generally found knotted together, but swim like an eel.”

Mr. Manger exhibited a collection of crustacea from the Red Sea.

Mr. R. Adkin exhibited a series of *Retinea resinella*, L., together with specimens of the resinous nodules in which the larva feeds, attached to twigs of the Scotch fir (*Pinus sylvestris*, L.), and sections of the same (Plate I., figs. 12 and 13), and read the following notes:—

“*Retinea resinella*, although a species well known on the

continent of Europe, appears to have attracted little attention in this country, and so far as the literature on the subject is concerned the most extended notice of the manner of feeding of the larva appears in Wilkinson's 'British Tortrices,' where we read that 'The larva feeds within a hollow resinous exudation from the branches of pine trees, occasioned by the wound in the bark made by the young larva feeding therein.' I have therefore thought that a few notes upon the larvæ from which the series exhibited this evening were bred may be of interest. But before proceeding with them I may take the opportunity to mention that the insect described and figured in Westwood and Humphreys' 'British Moths,' under the name of *Orthotænia resinella*, and said to have been taken in fir plantations in Kent and Surrey, should probably be referred to *Retinea turionana*, Hb.; certainly not to this species, which, so far as this country is concerned, has occurred only in the more northern parts of our islands, and even there it is by no means generally distributed, but, as is the case with many other fir-feeding Tortrices, it has usually been present in some numbers in the few favoured places where it has been observed, and so far as I am aware there is no record of it from any locality south of Perthshire.

"In the beginning of May of last year (1888) I heard from Mr. Salvage, who was then collecting in the neighbourhood of Forres, a town on the southern coast of the Moray Firth, that he had observed larvæ of this species feeding in a resinous exudation on the twigs of the Scotch firs (*Pinus sylvestris*) that abounded in the district; they were then small, and did not increase much in size during the month. After this they fed up rapidly, and by the end of June had the appearance of being nearly full fed; they, however, showed no appearance of pupating, and at the end of September, when he left Forres for the South, bringing a quantity of the fir twigs with the resinous nodules attached with him, they were still larvæ.

"Having heard of the non-success attending some previous attempts to rear this species, I determined so soon as the larvæ came into my possession to experiment upon some of them by keeping them at a higher temperature than they would experience in a state of nature; and accordingly I

selected one of the largest twigs, placed it in a glass cylinder with the end of the stalk in water, and kept it in a warm room. From this a moth emerged on 12th December, a full-sized perfect specimen. Thus encouraged I selected ten other twigs, and treated them in a similar manner; from these a perfect moth emerged on 1st February, 1889, the other nine showing no signs of coming out during the month. Between the 2nd and 8th of March five of the pupæ left their resinous habitations, fell to the bottom of the cylinder, where they rolled and twisted about in a most lively fashion, but only one of them produced a moth, and that a cripple, the others dying after wriggling about incessantly for six or seven days and nights; in the meanwhile perfect moths emerged from the four remaining pupæ.

“The rest of the larvæ had been left out of doors through the winter, sheltered from heavy rain, but otherwise exposed to the weather, the twigs on which they were feeding being stuck in the sand kept moistened. On examining them on 7th April they were still larvæ; and it was not until the 20th that I found a pupa. The first moth from these emerged on 25th May, and the last on 3rd June. The perfect insect, like the larva, appeared to be of very sluggish habit, and when disturbed from the needles on which it rested flew only to the next nearest to settle down again.

“Having thus traced the insect through its later stages, it may be well before drawing conclusions, to examine its habitation with a view to arriving at its earlier economy. Viewed externally we see a fir twig with the terminal shoot dwarfed or more frequently divided into two or more separate shoots, growing at an angle to the main twig, which has a resinous nodule attached to it, much hidden by the needles, some of the lower series of which often pass through it. If we cut a longitudinal section completely through the twig and nodule, so as to expose their interiors to view (an operation that is easily performed with a sharp knife), we find a series of workings apparently commencing at a point some three-quarters of an inch before the end of the old wood, with a narrow gallery immediately beneath the bark; this is continued in the direction of growth, gradually widening, but always on the same side of the twig, until it reaches the base

of the young shoot, which is completely hollowed out. The nodule is situated at the opposite side of the twig to that on which the gallery is carried, and extends from a point somewhat below the commencement of the gallery up to the new wood ; it consists of an outer and an inner chamber, the former of which communicates at its upper end with the hollowed-out portion of the shoot, while the latter appears to be simply a receptacle for the pupa, and is probably not formed until the larva is about to change. The bark and a portion of the wood of the twig on the side next the nodule are also eaten away, but not to such an extent as to make a direct communication with the narrow gallery on the opposite side.

"If we now compare these two sets of observations, it will be found that they fit the one into the other, and we are able to arrive at a probable life-history of the species, which would appear to be as follows :—The egg is deposited on the twigs of the fir, and upon hatching, the young larva eats through the bark, forms the narrow gallery, and feeds upon the soft wood of the tender shoot then growing ; this operation probably occupying its first summer. It now taps the bark on the opposite side to that by which it entered, and causes the sap to flow, which by its own weight spreads along the twig in the direction of the stem, congeals, and forms a resinous lump, the inside of which the larva gnaws away, at the same time devouring the bark, and a portion of the wood next it, as it becomes covered, until it has obtained a sufficient size, and thus makes a habitation in which to pass its first winter. With the approach of spring the sap begins to flow again, and this probably supplies the larva with nourishment, it attaining its most rapid growth at the time when the flush is greatest. It remains as a full fed larva through its second autumn and winter, pupates in April, and the moth emerges at the end of May or early in June, thus occupying a period of two years in completing its metamorphosis."

NOVEMBER 14th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. E. H. R. Hillsworth, T. Hudson, M. Farrant, and J. P. Nevell were elected members.

Mr. J. Jäger exhibited a bred series of *Agrotis ripæ*, Hb.,

and read the following notes as to his experience in rearing the species :—

“While staying near Tenby in August, 1887, I found the larvæ of this species in large numbers feeding on the *Suaeda maritima*, Dum., and *Cakile maritima*, Scop. The insect had previously been taken freely at sugar, and even at the lamp-posts in the town. I gathered a number of the larvæ about the middle of September, put them on ordinary silver sand (about 1 foot), but found them all dried up in the spring following. In the summer, 1888, the sand hills from some cause or other were almost denuded of the food-plant; yet the larvæ were again to be found in the sand, although still very small up to the middle of September, when they are usually full-fed. I brought some home, and this time I provided them with 3 feet of sea sand, the result being that I reared about half of them, but all very dwarfed, which I was not surprised at, as the larvæ, small as they were, did not feed any more after September 5th. I have ascertained that they hibernated quite 3 ft. down in the sand, but pupated just below the surface about June 15th, whilst the moths appeared early in July.

“I have this season brought a number of larvæ from the coast of Cumberland, where I found them in abundance, and as they were much larger, I hope to meet with a better result under the same treatment. I may mention that two gentlemen at Tenby had repeatedly tried to rear them, but failed.

“They are said to have a great propensity for cannibalism, but I have not experienced this.”

Mr. R. Adkin exhibited a long and varied series of *Acidalia marginepunctata*, Goze., from Eastbourne, and remarked that they, together with a great many more, were taken at rest on the rough stones along the parades during the past August. He believed the species was of general occurrence on our southern coasts, and he had met with it both at Eastbourne and other similar localities on many previous occasions, both at rest and on gas lamps; but it was not until he noticed its habit of resting on the rough stones and rocks near the ground, that he had found it in any quantity. The range of variation was considerable, some specimens having a clear creamy-white ground colour, with the usual

markings delicately pencilled, others a decided grey ground colour, with the markings in darker shades of the same; while two or three had a distinct black shade extending from the base towards the centre of the primaries.

Mr. Tutt exhibited a drawer of *Gnophos obscuraria*, Hb., from various localities, arranged to show the geographical range of variation.

Mr. Tugwell exhibited strongly divergent forms of *Agrotis tritici*, L., and *A. cursoria*, Bork., from English, Irish, and Scotch localities.

Mr. Wellman exhibited a specimen of *Nemeophila plantaginis*, L., var. *hospita*, Schiff., taken in Yorkshire, 1860.

Mr. R. Adkin, on behalf of Mr. Austin, exhibited a variety of *Lycæna icarus*, Rott., ♂ taken at Folkestone, the upper-side of which was of a pale bluish lavender colour, and on the underside the usual spots were absent, their place being occupied by thin blackish rings (Plate I., fig. 1). Also a specimen of *Lycæna bellargus*, Rott., ♂ from the same locality, the spots on the underside of which were entirely wanting with the exception of the discoidal, which was strongly produced (Plate I., fig. 2). ? white
(See fig)

Mr. J. Jäger exhibited shells found among *Impatiens noli-me-tangere*, L., from the Lake District, which Mr. Step stated were *Cochlicopa lubrica*, Mull., and immature forms of *Helix rufescens*, Penn., *H. caperata*, Mont., *Zonites crystallinus*, Mull., and others.

Mr. C. Fenn exhibited a long series of *Hybernica auran-tiaria*, Esp., from North Kent, showing the prevalence of the typical form.

Mr. Elisha exhibited bred specimens of *Deilephila galii*, Schiff., bred from pupæ forced during March at a temperature of from 60° to 70°. The specimens emerged from 14 to 16 days after being placed in this heat, and not any of the pupæ had died.

The Secretary read the following communications from Mr. T. D. A. Cockerell:—

“Do the colours of living Insects fade?—The males of a small American butterfly, *Nathalis iole*, Boisduval, present orange spots near the upper edge of the secondaries, which spots are liable to (and I believe always do) fade suddenly

some time after the insect has been killed and preserved for the cabinet. This change of colour is independent of light. Now, I have found the *living* butterfly also with these spots pale yellow, just like the faded specimens, which originally had them orange. What are we to suppose? Are there two distinct varieties of the butterfly as regards the colour of these spots, or do they sometimes fade to yellow even during the lifetime of the butterfly? I cannot help inclining strongly to the former view, and yet the idea of insects fading while still alive is not altogether new. Mr. T. L. Mead, in his report on the butterflies of the Wheeler Expedition to the Central Region of North America (published 1875), states that he took examples of a *Phyciodes* near Salt Lake City, which 'had certainly been bleached by the action of the weather.' And we know that the effect of the dry heat of the arid region of North America is to give a pallid aspect to the whole fauna, though it is apparently not yet proved that this bleaching influence extends to butterflies after they are fully mature. I should like to ask the members of the Society, therefore, whether in their experience they have known Lepidoptera which were bleached or faded when captured; this bleaching having taken place during the insect's lifetime, and *since* it emerged from the pupa-case and dried its wings? Of course I do not refer to specimens which have lost part of their scales, which are commoner than entomologists would wish; these are rubbed, and by no means bleached.

"*Hybrids and Mongrels*.—The question of the possibility of true hybrid or mongrel races being established in a wild state has been much discussed. It would be hard indeed to prove that this is impossible, but there is certainly a strong tendency among the progeny of crosses between nearly allied forms to resemble one or the other parent, instead of being intermediate, while everybody knows that the blended hybrid products of distinct species are in nearly every case infertile. As illustrating this first-mentioned tendency, we may notice Mr. Arkle's interesting note in the September *Entomologist*. The progeny of a cross between *Amphidasys betularia* type and var. *doubledayaria*, taken in Delamere Forest, were *all either* type or *doubledayaria*. *None* were

intermediate forms. Darwin gives analogous instances in chap. xv. of his 'Variation of Animals and Plants under Domestication.' But the question how far this tendency to resemble the parents goes has never been definitely settled, and much may yet be done—by experimental crossing—to determine the point. Will not those Lepidopterists who breed so many insects annually take this matter up? They might without much difficulty obtain crosses between varieties of several species, and the results, if recorded and tabulated when numerous, would furnish statistics more powerful than any amount of argument from probabilities.

NOVEMBER 28th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Messrs. M. Cameron, C. G. Barrett, F.E.S., F. P. Trewicke, A. V. Legros, L. W. Harris, A. J. Robertson, C. H. Lemmon, W. Howgrave, L. H. Strong, and W. E. Nicholson were elected members.

Mr. Jenner Weir exhibited specimens of *Linnaea chrysippus*, L., and *Hypolimnas misippus*, L., and remarked that there were four specimens of *H. misippus* and four of *L. chrysippus-alcippus*, Cramer, which he had received from Dr. Percy Rendall, from the Gambia; one of the females of the former was a mimic of *Linnaea chrysippus*, one of *Linnaea chrysippus-alcippus*, and the other intermediate between the two, the white of the under wings characteristic of the latter being reduced to a spot. Dr. Rendall informed him that he had never seen a specimen of the typical *L. chrysippus* in the district, so it might be suggested that a widely distributed species as *H. misippus* had reached the Gambia subsequent to the differentiation of *L. alcippus*, and that the mimicry had in some specimens not yet commenced, in others it was incipient, and in some complete.

Mr. Weir also exhibited *Linnaea dorippus*, Klug., from Eastern Africa, and a female mimic of *Hypolimnas misippus*; *Linnaea chrysippus* from Ceylon, and its mimic *Hypolimnas misippus*; *Linnaea chrysippus* from Natal, with a white spot on the under wing similar to that of the intermediate female of *Hypolimnas misippus* referred to above.

Lastly, a female of *H. misippus*, which appeared to mimic a *Limnas* intermediate in colour between *L. dorippus* and *L. chrysippus*; it would therefore appear that where these two species of *Limnas* were found together and hybridised, the mimicing female of the *Hypolimnas* was found similar in colour to the hybrid.

Mr. T. R. Billups read a paper on the "Irish Staphylinidæ," by the Rev. W. F. Johnson.

DECEMBER 12th, 1889.

T. R. BILLUPS, Esq., F.E.S., *President*, in the Chair.

Mr. A. Beaumont, F.E.S., was elected a member.

Mr. W. H. Tugwell exhibited diverse forms of *Tæniocampa gracilis*, Fb., pale grey forms from the London District, and red forms from the New Forest.

Mr. R. Adkin exhibited a series of *Peronea sponsana*, Fb., from the New Forest, in which the primaries were of a pale grey colour, with a distinct reddish blotch extending from the middle of the costa more than half way towards the inner margin. Mr. South remarked that on a recent visit to Haslemere he had taken a single specimen of a similar form. Mr. C. G. Barrett said that although he had resided at Haslemere for some years, and had frequently taken the type, he had never met with this variety, and it appeared to be a case of a particular form of a species extending its geographical range.

Mr. Ince exhibited a collection of Arachnida from Switzerland.

Mr. C. Fenn exhibited a volume of original coloured drawings of larvæ, pupæ, and imagines of Lepidoptera, with food plants.

PRACTICAL HINTS ON BREEDING MACRO- LEPIDOPTERA.

Read March 14th, 1889, by Mr. W. H. TUGWELL.

Practical hints on breeding Macro-Lepidoptera is the subject of my short paper this evening, and before commencing I must apologise to those gentlemen present, whose experience is possibly far greater than my own; but as these remarks are intended for beginners, I trust they may prove of some little interest to them, and if so my object will be fully attained.

When I commenced the study of our Macro-Lepidoptera, early in 1842, the breeding of insects was rarely practised in England, and very little indeed was known of the larvæ of our native species, so that when in 1857 Mr. H. T. Stainton published his well-known manual, he had mainly to depend on Continental authors for the description of the larvæ therein referred to; and even with that aid a considerable number appeared to be quite unknown, as the following rough table will show. Stainton gives some 769 species of Macro-Lepidoptera, *i.e.*, from the Diurni to the end of the Geometræ:—

Larvæ described.		English Authors.		Continental Authors.		Unknown.	
Butterflies	66	...	13	...	48	...	5
Sphinges	36	...	7	...	22	...	7
Bombyces, etc.	101	...	34	...	56	...	11
Noctuæ	294	...	31	...	224	...	39
Geometræ	272	...	28	...	176	...	68
Total		113		526		130	

We could hardly feel proud of that state of our knowledge, but it is now, happily, very much improved. The number of larvæ described by the joint efforts of British Lepidopterists has wonderfully increased, whilst the list of

those unknown has from the same efforts been much reduced. This improvement is largely due to such men as the late Rev. Harper Crewe, the late Rev. Joseph Hellins, and the late William Buckler, whose posthumous work is now being published by the Ray Society.

The good work that they initiated is still progressing, aided by many worthy successors, such as Messrs. W. H. B. Fletcher, G. T. Porritt, C. G. Barrett, etc. Still there remains much to be done; even in some fairly common species the larvæ are unknown; for example, *Hesperia comma* is by no means rare at Boxhill and Mickleham. Nothing is known of its larva; and *Colias hyale* has never been reared in England. The Geometræ are now pretty well worked up, but in the Noctuæ many remain for some of us to win our entomological spurs.

The great advantage of breeding lepidoptera over merely catching them, is not only that we get a biological knowledge of our study, but our cabinets are wonderfully enriched both in number of species and condition of specimens. Whilst many errors have been swept away by breeding, several insects which from their great dissimilarity had been looked upon as distinct, have been proved to be only extreme forms of a variable species, and *vice versâ*.

After these short prefatory remarks, I will endeavour to give a few practical hints on breeding, and will commence at the egg stage. When possible I much prefer breeding from ova. You not only get the whole life-history, but you also get better results: larvæ that have been beaten out, are often either injured by the jar, or stung by various parasites. Ova differ much in form, and also in the length of time they remain unhatched. It is always desirable to have some idea as to the period of hatching, not only keeping them properly, so as not to kill them—for some remain in the egg-state eight or nine months, others only a few days—but also to be provided with food for the larvæ as soon as they emerge, a very important matter. A glass-topped box or small wide-mouth bottle is convenient to place eggs in that are near hatching. I prefer them to do so, before placing them on food, as you then know how many larvæ to look for in the first change; that is very desirable and saves time.

Treatment of recently hatched larvæ.—When dealing with such small things as recently hatched larvæ, it is desirable to have them in rather close quarters for several reasons ; one is, that it often happens that they have a tendency to be restless, and they may get off the food if they have too much room, and die. Another thing, a small piece of food in a large cage is apt to wither quickly, and if a lot of food is used it is very troublesome to change them. After very many trials of various plans, the following method has yielded me the best results. Get two wide-mouth bottles, the larger of the two having a mouth sufficiently wide to allow the smaller to pass quite inside, place the young larvæ inside the smaller bottle with some recently-gathered food, but carefully avoid all moisture on the surface of leaves, etc. ; tie over the mouth of bottle with a piece of washed-out calico. Now place this smaller bottle mouth downwards inside the larger, then tie over the mouth of the larger bottle with calico, and then on reversing ends of this, the smaller bottle stands mouth uppermost, and by this means the condensation of moisture from the plant takes place on the side of the larger, *i.e.*, outer bottle, leaving the inner bottle free from it. The condensation of moisture is always a great trouble in the earlier stages of breeding. All plants are necessarily full of sap, and the exhalation from their stomata settles on the sides of the glass cylinder or bottle, and the delicate little larvæ often get drowned in it, as most of us have proved. This doubled casing of glass answers admirably, as the condensation, if it takes place at all, will be always on the outer bottle, and consequently fraught with no danger to the tiny and tender brood. This may seem rather a complicated matter, but in practice it is by no means difficult.

According to my experience the natural sap of the plant is a more healthy food than the more watery juices that result from food-plants immersed in water. Always, at least by choice, gather your food-plants in the early morning, and if possible carry them home in tins. By this means you have the whole plant full of natural sap. If gathered in the middle of the day, the sun will have materially exhausted your food, and it will then often wither very quickly. Then, again, when selecting branches of trees or shrubs to take

home for food for larvæ, select well-developed wood with healthy sound foliage, and not the young and succulent shoots. The matured wood keeps its freshness longer, and as a rule is far the best food; too succulent a growth is prone to bring on diarrhœa.

With the growth of the larvæ, you must naturally increase the size of the bottles or cages. Always avoid overcrowding.

It may here be convenient to say a few words on the different styles or methods of feeding up. The close or dry answers well in many cases. By close or dry I mean that the food-plant has not its stems immersed in water, it is only freshly gathered; and by being in a fairly close bottle or jar, and not exposed to a current of dry air, it keeps fresh and well for nearly a week. An ordinary white jam pot is a simple and convenient receptacle; first tie over it a piece of muslin, and then cover it with a piece of ordinary window glass. Some grind the jam-pot edges, and merely cover with glass; but personally I prefer the first plan, as the little inequalities of surface allow a certain amount of air to penetrate, but not enough to dry up the food. Wide-mouth sweet bottles are useful. I have used them up to the capacity of a gallon. I am much in favour of this dry feeding for small geometers, etc. By this process I have succeeded in breeding very many species.

A clean and dry flower-pot, substituted for the white jam-pot, also answers well. I may say that in one I last year bred a long series of *Tæniocampa leucographa* on *Plantago lanceolata*, without a single death, and the larvæ were evidently happy and fed up well; nothing could possibly have done better.

Perhaps the very best cage that I have ever seen or used is what is known as a bee-glass,¹ 10 or 12 inches in diameter. These may be used in two ways as follows:—The glass can be comfortably filled with food, the stems passing through the hole at bottom, and the whole allowed to stand resting on a jam-pot containing water. *Caution*: Always well stop the hole with cotton wool, or other convenient substance, to pre-

¹ What is called a bee-glass is the ordinary form of horticultural glass of a bell shape; but instead of the round button-like knob at bottom being solid, it has a hole quite through it.

vent the larvæ from crawling into the water below. They will do so, if you are not careful. Now by simply tying a piece of muslin over the top of the glass, you have a perfect breeding-cage. Food keeps well, larvæ get air and light, and the results are perfectly satisfactory. You can readily watch your pets, and note their growth, change of skin, and peculiarities. I recollect once being much struck at the mode in which *Chesias rufata* fed itself. It feeds on the common broom, the trifoliate leaflets of which are attached by short pedicels to the stem, and instead of nibbling off the sides of the leaflets, as is general with larvæ when feeding, *rufata* went at once for the short pedicel, bit it quite through, holding it the while securely in its fore legs. It then held the leaflet up to its mouth by its legs, as a boy would a penny bun, twisting it round and round most deftly till all was eaten. I never before saw a larva feed itself in that way. This was not an isolated or single occasion, but time after time the operation was repeated.

But to continue with my breeding experience. The second way in which this bee-glass is conveniently used, is the reverse of the one just described, and is specially adapted to those larvæ that pupate under the ground. The *modus operandi* is as follows:—Take a large-sized earthen pan—what is known as a propagating pan—that is, a shallow one from 4 to 6 inches deep—and fill this with prepared earth. I say prepared, as it is very desirable that earth in puparia should be absolutely freed from insect pests, such as *pseudopretella*, by baking. The best soil is a light sandy peat, with pieces of rotten wood, commonly known as touchwood, mixed with it. This is a good addition, as many larvæ are very fond of boring into such substances. Well, having filled your pan with this earth, then place upon it a perforated zinc ring or cylinder some 4 or 5 inches deep, the top or upper edge of which is turned over, to fit the broad diameter of the bee-glass, so that it can rest on this ring of perforated zinc. By this plan you get a free passage of air through the zinc, and out of the top of the bee-glass, which is most necessary for many larvæ. This necessitates, of course, some ready means of having a small vessel of water to plunge the stems of food-plant in, and this is best done by the zinc

stands as shown.¹ This, of course, is buried under the earth in the pan, and is not removed. By having two or three bottles when shifting food, one is got ready, and the other removed, when the larvæ can be at once replaced in a cage. Avoid fingering the larvæ if possible. I generally use a pair of scissors to cut off the piece of twig, rather than pull them off, as some species hold on most tenaciously. It is a good plan to cover the earth with a layer of dry *sphagnum* or bog-moss. It serves a twofold purpose: it enables the larvæ to hide away in the day time, as many Noctuæ larvæ especially do, and it also allows the frass to be shaken away without disturbing the soil.

This bee-glass feeding cage, used in one or the other fashion, is in my experience the most generally useful cage that can possibly be employed. I may safely say that in such I have bred thousands of Lepidoptera, such species as *Asteroscopus nubeculosa*, *Endromis versicolor*, *Acronycta alni*, *A. strigosa*; the last two especially require rotten wood to pupate, *Tæniocampa populeti*, *T. opima*, and *Xylina furcifera* (Mr. Evan John kindly gave me twenty ova of the last, and in my bee-glass and pan I bred twenty splendid moths). Possibly I ought to caution you to be careful that the zinc ring goes to the bottom of the pan, or else some larvæ, such as *Nyssia hispidaria*, which require a good depth of soil, and are prone to be restless on touching the bottom of the shallow earthen pan, will ramble, and very possibly come up again outside the zinc, and escape. This did occur to me with one of my earliest broods of *hispidaria*, and I lost every one of them so. I made a note of it.

For breeding hairy larvæ I find that more air is necessary as a rule; very many of them absolutely require sunshine, but it is never safe to expose larvæ to the sun's rays in glass or hardly with metal cages. The stored heat kills them. For hairy larvæ, open canvas cages answer best, as they allow free passage of air, and may be exposed to the sun, as they do not store up heat. My best results with such larvæ as

¹ A flat circular disc of zinc, say 5 inches in diameter, has an upright cylinder of zinc soldered on, in which a 2 or 3 oz. wide mouth round bottle will just slide in and out; this bottle holds the stems of food-plant, and can be readily changed.

require sun and air have been obtained by modifications of the canvas cage. One species that most Lepidopterists have found extremely difficult to breed is *Agrotis agathina*; the only time I tried to breed this insect, I adopted the following plan with success (out of thirty-two larvæ I bred twenty-eight perfect specimens). An earthen propagating pan was planted beforehand, by way of preparation, with a nice lot of heather (*Calluna vulgaris*) all round the outer edge of the pan, leaving some four or five inches in the centre clear of plants for renewing food, and this was obtained by a trip to Shirley once a week. I used to select a few healthy plants of young and well leaved *Erica tetralix* (the pale maiden heath), and these were dug up and plunged into a small earthen pan to occupy the space left free in the larger pan. By this means I was enabled to change the food with very little disturbance of the larvæ. The whole was covered with canvas on a wire frame. It was a little trouble, but then the result was a success.

I may mention that possibly one reason of my success was, that I searched for my larvæ. The general way is to sweep, and in my opinion many of the larvæ get more or less injured by the knocking about in the net. You may get more by sweeping, but probably the best and most reliable plan is to search with a light for them.

Feeding on growing plants.—At first sight it would appear that the very best plan for feeding larva, would be by planting food in flower pots, but I must say the result to me has been rather disappointing. Very few plants do well, *i.e.*, grow healthily in the necessary confinement—they so often fog off and become mildewed. It answers well enough on growing trees, where you can “sleeve” them on the branches, but not so well on soft herbaceous plants. To those Lepidopterists who live in the country, and have good gardens away from the nuisance of London smoke, this plan of sleeving will be found most useful. All that is necessary is to plant a selection of oak, alder, ash, birch, willow, etc., and by sleeves of canvas or gauze good results may be attained with little labour. I well recollect a visit I paid to my friend the late J. G. Ross, of Bathampton, to whom so many of us owe our present fine series of *A. alni*. In his garden of two or three acres, he had quite a plantation of young alders, and

on these he had sleeved an immense number of *alni* larvæ. Needless to say, he succeeded admirably, and bred thousands. The great and almost only difficulty that follows sleeving, is with those larvæ that require earth in which to pupate. That can be accomplished by fixing on the branch a pot of earth; but that is not so easily done. Of course you can also pick out your full-fed larvæ, and place them in other cages. As far as *alni* is concerned all that is necessary is to place inside the sleeves some pieces of rotten wood, or cut lengths of old pithy bramble stems or elder, and then the larvæ burrow in the pith to pupate.

Internal feeding larvæ.—To feed up these from the egg is generally a difficult task, and one can only succeed well with a few species, root feeders, such as *templi*, etc. You have only to get prepared a few boxes of earth, and plant roots of cow parsnip (*Heracleum sphondylium*); and as soon as the larvæ hatch, transfer three or four into the axils of the growing leaves on each head of plant, and then they are left to themselves. No care is taken to cover the plant until the middle of July; then you may cut down your plant within a few inches of the root, and cover with canvas. This is to prevent the escape of larvæ when they leave the plant to pupate, as then they will at times roam about. I have by this means bred *templi* freely. Some Lepidopterists use only the roots of the garden parsnip, but they are apt to go very soft; still they have been found to succeed fairly well, though I think *Heracleum sphondylium* is the best food. Many root feeders may be readily collected when nearly or quite full-fed; these roots are simply plunged into mould, in boxes, canvas or gauze covered, and you may breed many good things. Thus I have bred a fine lot of the once rare *Sesia chrysidiformis* from the roots of common dock and sorrel, collected at Folkestone Warren or at Eastbourne. I have not attempted to describe every possible form of breeding cage, but only such as have after over forty years' experience yielded me good results.

Perhaps, if not trespassing too long on your patience, I may say a word or two on make-shift cages, when we may be away from home, and possibly have turned up some good larvæ; as for example, this year *Deilephila galii* turned up

with me at Deal. I paid a visit to a hatter, purchased a cartoon hat-box, cut out the centre within an inch of the outer rim of the top of the box, and covered it with coarse muslin. The lid then pulled down fixed the gauze or muslin securely, and formed a really good make-shift cage. The food of course must be put into either a wide-mouth bottle or a small rummer glass ; 7lb. square biscuit tins, with the tops cut out and the edges bent so as to allow a glass top to be slid in, form excellent make-shift puparia.

Treatment of hibernating larvæ.—Very many of our larvæ hibernate, and a few words on their management may be useful. As soon as winter truly settles the season, and food-plants get killed, larvæ crawl away, and many of them spin little pads of silk, on which they partly fix themselves ; others merely find a convenient spot on which to rest and pass the winter. Generally, I like to place in cages with hibernating larvæ some plant that will not readily get mouldy, such as ground ivy or small pieces of true ivy, and some dry sphagnum. On these the larvæ can rest without much fear of mould ; keep them in a cool greenhouse, avoiding absolute drought and sunshine. The first is prone to dry up your larvæ, and the latter possibly may awaken them from their winter sleep before nature has provided any growing plant for feeding them on. Early in March or April, according to season, you must watch your little ones, and if they once begin to move it is best to take them into a warmer place, and by giving them fresh food they will soon begin to eat and grow rapidly.

The best results in breeding will generally be secured by confining yourself to moderate numbers, when there will be not only fewer deaths, but the insects themselves will often be finer. Overcrowding, combined with stale food, is almost certain to bring on disease. This often takes the form of diarrhœa, and carries off the entire brood. One of the first symptoms of this is found in the frass getting soft and watery, and the larvæ themselves getting frequently soiled with it, the anal segments particularly so. It is not often one can do much to arrest this disease when once it asserts itself. A plan I have adopted with fair success is this : A small brood—some thirty larvæ of *Endromis versicolor*—showed unmistakeable signs

of diarrhœa ; the anal segments were fouled, and in some of them evidently stuck together. I tried an experiment: I took each larva separately in my open hand, held it under a tap of running cold water, and gently brushed it the while by means of a camel hair pencil. They were then placed on clean fresh food, and stood out in the sunshine. As a result, most of them safely pupated, and produced in due course fine moths. With a good species this is worth trying, at any rate.

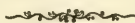
In this paper I have not attempted to describe larvæ collecting, only their treatment. Still, perhaps a few passing hints on how to secure a good series of *Acherontia atropos* may be useful. It is well known that the larvæ of *atropos* feed on the leaves of the potato, and that in some seasons the men engaged in digging the tubers find pupæ in some numbers; but they often get more or less injured before they reach our hands, and in consequence die. It is much better to seek the larvæ ourselves. At first sight it may appear difficult to find a few larvæ in a large field of potatoes, but in fact it is fairly easy to do so. The larvæ when nearly full grown are very voracious and quite strip the haulm of the leaves, so that you may walk down between the rows of potatoes and take ten yards on either side of you with ease and certainty of spotting any *atropos* larvæ that may be there, the bared stems showing up a long way off.

You will soon see if the larva is still about by the abundance of fresh frass; if dried up it has probably pupated. In this manner I found thirteen in two mornings' work at Deal, and bred them all by forcing. I much advise forcing for large Sphingidæ. Forcing is simple and safe. An ordinary biscuit box, with a partly glass lid, makes a good and simple forcing cage. Lay in two inches of clean sand, and on it place the pupæ. *Do not bury them in the sand.* Cover them over lightly with a layer of damp sphagnum, with a few bushy twigs for the moths to crawl up and expand their wings, and the cage is complete. The cage only requires to be placed in a warm room at from 75° to 80°, and you will then breed your moths in midwinter with better results and with plenty of time to see to them in the dull season.

In conclusion I would advise every Entomologist to study field botany; not only will it enhance the pleasure of his

outings, but materially help him to breed Lepidoptera; and should this paper in any way aid that object its purpose will be fully served.

N.B.—This paper was illustrated by objects and models.



IRISH STAPHYLINIDÆ.

By Rev. W. F. JOHNSON, M.A., F.E.S. Read 28th Nov., 1889.

IN my paper on the Irish Geodephaga, I remarked that rather less than half of the British species had been recorded from Ireland. The list of Irish Staphylinidæ contains an even smaller proportion of the British species. Canon Fowler, in his admirable work on the Coleoptera of the British Islands, gives the number of species of this family on the British list as upwards of 800; of these less than 300 have been recorded from Ireland. I have in my own collection Irish specimens of nearly two-thirds of these species, most of which have been taken here.

There are no materials for remarks on distribution, as nearly half the records are from single localities. I have, however, made out lists of these single locality records which may perhaps prove interesting.

Recorded from Armagh only:—*Aleochara cuniculorum*, *Oxyptoda longiuscula*, *Calodera æthiops*, *Myrmedonia collaris*, *Alianta incana*, *Homalota imbecilla*, *gyllenhali*, *pagana*, *elegantula*, *nigricornis*, *corvina*, *atomaria*, *Tachyusa umbratica*, *Falagria obscura*, *Myllæna brevicornis*, *Tachyporus humerosus*, *transversalis*, *Tachinus laticollis*, *Bolitobius exoletus*, *Mycetoporus longulus*, *splendidus*, *Heterothops binolata*, *Quedius fumatus*, *Philonthus umbratilis*, *cephalotes*, *ebeninus*, *ventralis*, *quisquiliarius*, v. *dimidiatus*, *nigrita*, *micans*, *nigritulus*, *Actobius cinerascens*, *Xantholinus longiventris*, *Lathrobium longulum*, *terminatum*, *Sunius intermedius*, *diversus*, *Evæsthetus ruficapillus*, *læviusculus*, *Stenus melanarius*, Steph., *atratus*, *fuscipes*, *declaratus*, *argus*, *fuscicornis*, *palustris*, *binotatus*, *canescens*, Rosh. (major, Rey), *pallitarsis*, *cicindeloides*, *Platystethus nodifrons*, *Oxytelus insecatus*, *inustus*, *complanatus*, *Trogophleus bilineatus*, *elongatulus*, *foveolatus*, *corticinus*, *tenellus*, *Lesteva sharpi*, *Acidota crenata*, *Lathrimæum atrocephalum*, *Acrulia inflata*, *Anthobium minutum*, *Proteinus ovalis*, *Megarthus denticollis*, *depressus*.

From Carlingford.—*Quedius attenuatus*, *Ocypus combressus*, *Lathrobium rufipenne*, *Haploderus cælatus*, *Homalium læviusculum*.

From Killarney.—*Quedius umbrinus*, *Stenus guynemeri*, *vafellus*, *carbonarius*.

From Galway.—*Aleochara brevipennis*, *Stilicus geniculatus*, *Medon propinquus*, *Syntomium æneum*, *Homalium striatum*.

From Waterford.—*Aleochara morion*, *Homalota monticola*, *divisa*, *ravilla*, *villosula*, *aterrima*, *Quedius brevicornis*, *Lathrobium filiforme*, *Stilicus similis*, *Stenus pusillus*, *ossium*, *ærosus*, *bisoveolatus*, *Homalium allardi*.

From County Wicklow.—*Homalota currax*, *cambrica*, *hygrotopora*, *Falagria thoracica*, *Cafius xantholoma* (var. *variolosus*, Sharp), *Pæderus fuscipes*, *Ancyrophorus omalinus*.

From Dublin.—*Aleochara algarum*, *Microglossa nidicola*, *Tachyusa atra*, *Falagria sulcata*, *Hypocyptus læviusculus*, *Tachinus elongatus*, *Heterothops dissimilis*, *Ocypus similis*, *Cafius sericeus*, *Leptacinus parumpunctatus*, *batychnus*, *Lathrobium angusticolle*, *Bledius tricornis*, *atricapillus*, *Thinobius longipennis*, *Deleaster dichrous*, *Philorhinum sordidum*, *Proteinus atomarius*.

From County Down.—*Oxyroda rupicola*, *Ocyusa hibernica*, *Homalota clavipes*, *tibialis*, *nitidula*, *alpestris*, *oblongiuscula*, *eremita*, *valida*, *orbata*, *Geodromicus nigrita*.

From Belfast.—*Bryoporus cernuus*, *Philonthus thermarum*, *Pæderus littoralis*, *Stenus bipunctatus*, *canaliculatus*, *circularis*, *Bledius opacus*, *Hapalaræa pygmæa*.

The only Irish record for *Leistotrophus nebulosus* is Cushendun in the County Antrim, where it was taken by the Rev. S. A. Brenan (vide *Ent. Mo. Mag.*, xxv. 239). Of the Belfast records *Philonthus thermarum* and *Hapalaræa pygmæa* were taken many years ago by Mr. Robert Templeton. The specimens are in the museum of the Belfast Natural History and Philosophical Society, and have been identified by me. *Pæderus littoralis* was captured by Rev. J. Bristow, and given to me. The rest are Mr. Haliday's records. It will be seen that my own records in the above lists under Armagh and Carlingford are more numerous than those from all other localities put together, the exact numbers being seventy-three from Armagh and Carlingford, and sixty-eight from the rest. This arises not from any superior acuteness on my part, but from the fact that I have been working steadily *all the year round* in practically one locality, while the

other recorders either have been passing visitors to Ireland, or else have not continued to work at Coleoptera. A large number of the best Irish species have been recorded by Mr. Champion, Mr. J. J. Walker, and Dr. Power, who only came on a visit to Ireland. Mr. Haliday made a considerable collection of Coleoptera, but he soon turned his attention to Diptera, consequently his list of Coleoptera, as published in the Transactions of the Belfast Field Naturalists' Club, contains only eighty-seven species of Staphylinidæ. These facts, however, only go to prove that a rich harvest awaits the earnest worker among the Irish Staphylinidæ. I have several interesting species on my own list, and there are many rare insects among the other records. *Diglossa submarina* has its place on the British list on the authority of specimens sent from Ireland to Mr. Javet by Mr. Haliday. These were most probably taken in the Belfast district. What an opportunity is here for the re-discovery of this interesting beetle. *Ocyusa hibernica* was described by the late Mr. Rye from a specimen taken by Mr. Champion on Slieve Donard, the highest point in the Mourne mountains, in County Down, where probably more of the same await the enterprising collector.

I now propose to make a few remarks concerning such of my own records as may be of some interest.

Aleochara cunicolorum is decidedly rare here, and I have only two specimens in my collection. *Oxypoda longiuscula* is quite common here, and has probably been overlooked elsewhere. Of *Calodera æthiops* I have only succeeded hitherto in securing one specimen. *Myrmedonia collaris* is likewise represented by a single specimen, but no doubt more will make their appearance. I took a few *Alianta incana* from stems of *Typha latifolia*, which I was examining for pupæ of *Nonagria arundinis*. The reed is not uncommon about here, but is difficult to get at, as it grows most usually in bogs in the midst of water which the treacherous nature of the bottom renders it unsafe to attempt to wade. There is nothing very remarkable among my *Homalotæ*, except that *H. imbecilla* does not seem usually to occur so far inland. *Falagria obscura* is the only species of the genus which has occurred here, but it is very common, and probably occurs in other parts of the island. The var. *dimidiatus*, Steph., of *Philon-*

thus quisquiliarius occurs sparingly under stones on the shore of Lowry's Lough, and in a similar locality at Lough Neagh on Coney Island. It is exceedingly active and very troublesome to catch among the stones. I have taken a few *Stenus canescens*, Rosh. (*major*, Rey), by sweeping reeds on the edge of a small lake near Navan Fort, and at Lowry's Lough, where it was accompanied by *S. pubescens* and *S. pallitarsis*; this last is by no means uncommon here. *Lestevea sharpi* I took from the under side of stones in the bed of a little brook, but it is not common.

In conclusion I may remark that I find moss most productive of Staphylinidæ, and moss is fortunately very abundant and luxuriant here. I am often astonished at the swarms of insects which lodge in it. I append a list, but merely to indicate the present state of affairs with regard to the Staphylinidæ.

LIST OF IRISH STAPHYLINIDÆ.

Compiled October, 1889, by Rev. W. F. JOHNSON, M.A., F.E.S.

Aleochara fuscipes, brevipennis, bipunctata, cuniculorum, lanuginosa, mæsta, nitida, v. *bilineata, morion, grisea, algarum, obscurella*; *Microglossa nidicola*; *Oxyopoda opaca, longiuscula, rupicola*; *Ocyusa hibernica*; *Ilyobates nigricollis*; *Calodera æthiops*; *Myrmedonia collaris*; *Astilbus canaliculatus*; *Homalota monticola, circellaris, elegantula, eremita, aquatica, valida, trinotata, divisa, nigricornis, ravilla, corvina, atomaria, villosula, atramentaria, sordida, aterrima, muscorum, orbata, fungi, clientula*; *Tachyusa umbratica, atra*; *Falagria sulcata, thoracica, obscura*; *Autalia rivularis*; *Encephalus complicans*; *Phytosus spinifer*; *Diglossa mersa, submarina*; *Oligota inflata*; *Myllæna brevicornis*; *Hypocyrtus longicornis, læviusculus, ovulum*; *Conosoma pubescens*; *pedicularius, lividus*; *Tachyporus obtusus*, v. *nitidicollis, solutus, chrysomelinus, humerosus, hypnorum, pusillus, brunneus, transversalis*; *Cilea silphoides*; *Tachinus rufipes, subterraneus, marginellus, laticollis, elongatus*; *Megacronus cingulatus, analis*; *Bryoporus cernuus*; *Bolitobius lunatus, trinotatus, exoletus, pygmæus*; *Mycetoporus longulus, splendidus*; *Heterothops binotata, dissimilis*; *Quedius fulgidus, brevicornis, cinctus, fuliginosus, tristis, molochinus, fumatus, umbrinus, rufipes, attenuatus, semicæneus*; *Creophilus maxillosus*; *Leistotrophus nebulosus*; *Staphylinus pubescens, erythropterus, cæsareus*; *Ocybus olens, similis, brunnipes, cupreus, ater, morio, compressus*; *Philonthus splendens, intermedius, laminatus, æneus, proximus, addendus, decorus, politus, varius, marginatus, umbratilis, cephalotes, fimetarius, ebeninus, sanguinolentus, cruentatus, varians, ventralis, quisquiliarius*, v. *dimidiatus, thermarum*,

nigrita, *micans*, *nigritulus*, *trossulus*, *puella*; *Cafus fucicola*, *xantholoma*, *sericeus*; *Actobius cinerascens*; *Xantholinus glabratus*, *punctulatus*, *ochraceus*, *atratus*, *tricolor*, *longiventris*; *Leptacinus parumpunctatus*, *batychnus*; *Othius fulvipennis*, *læviusculus*, *melanocephalus*, *myrmecophilus*; *Lathrobium elongatum*, *boreale*, *fulvipenne*, *rufipenne*, *brunnipes*, *longulum*, *filiforme*, *quadratum*, *terminatum*, *multipunctum*, *angusticolle*; *Cryptobium glaberrimum*; *Stilicus rufipes*, *orbiculatus*, *similis*, *affinis*, *geniculatus*; *Medon propinquus*, *melanocephalus*; *Lithocharis ochracea*; *Sunius intermedius*, *diversus*, *angustatus*; *Pæderus littoralis*, *fuscipes*; *Evæsthetus ruficapillus*, *læviusculus*; *Stenus bipunctatus*, *guttula*, *bimaculatus*, *juno*, *guynemeri*, *speculator*, *providus* v. *rogeri*, *melanarius*, *atratus*, *canaliculatus*, *pusillus*, *fuscipes*, *circularis*, *vafellus*, *declaratus*, *carbonarius*, *argus*, *ossium*, *fuscicornis*, *geniculatus*, *palustris*, *impressus*, *ærosus*, *flavipes*, *pubescens*, *binotatus*, *canescens*, *pallitarsis*, *bifoveolatus*, *nitidiusculus*, *cicindeloides*, *similis*, *paganus*, *latifrons*; *Bledius tricornis*, *arenarius*, *opacus*, *atricapillus*; *Platystethus arenarius*, *cornutus*, *nodifrons*; *Oxytelus rugosus*, *insecatus*, *sculptus*, *laqueatus*, *inustus*, *sculpturatus*, *nitidulus*, *complanatus*, *tetracarinus*; *Haploderus cælatus*, *Ancyrophorus omalinus*; *Trogophlæus arcuatus*, *bilineatus*, *rivularis*, *elongatulus*, *foveolatus*, *corticinus*, *tenellus*; *Thinois longipennis*; *Syntomium æneum*; *Deleaster dichrous*; *Geodromicus nigrita*; *Lesteva longelytrata*, *sharpi*, *sicula*; *Acidota crenata*, *Lathrinæum atrocephalum*, *unicolor*; *Deliphrum tectum*, *Arpedium brachypterum*, *Philorhinum sordidum*; *Homalium rivulare*, *læviusculus*, *riparium*, *concinnum*, *deplanatum*, *striatum*; *Hapalaræa pygmæa*; *Acrulia inflata*, *Anthobium minutum*; *Proteinus ovalis*, *brachypterus*, *atomarius*; *Megarthus denticollis*, *depressus*, *Philæobium clypeatum*.



LIST OF MEMBERS.

Chief subjects of Study :—*h*, Hymenoptera ; *o*, Orthoptera ; *he*, Hemiptera ; *n*, Neuroptera ; *c*, Coleoptera ; *d*, Diptera ; *l*, Lepidoptera ; *orn*, Ornithology ; *r*, Reptilia ; *m*, Mollusca ; *cr*, Crustacea ; *b*, Botany ; *mi*, Microscopy ; *e*, signifies Exotic forms.

YEAR OF ELECTION.

- 1886 ADKIN, B. W., Brandon House, Morden Hill, Lewisham, S.E.
l, orn.
- 1882 ADKIN, R., F.E.S., Wellfield, Lingard's Road, Lewisham, S.E. *l.*
- 1886 ADYE, J. M., Somerford Grange, Christchurch, Hants. *l.*
- 1888 ATHERTON, R., Chorley, Lancashire. *l.*
- 1889 ATKINSON, F. H., 51, Buckingham Palace Road, S.W. *l.*
- 1888 ATMORE, E. A., F.E.S., 2, Haylett Terrace, King's Lynn,
Norfolk. *l.*
- 1888 AULD, H. A., Havelock House, Foot's Cray, Kent. *l.*
- 1887 BARCLAY, F. H., Leyton, Essex. *l, orn, palæontology.*
- 1884 BARKER, H. W., F.E.S., *Hon. Sec.*, 83, Brayard's Road,
Peckham, S.E. *l.*
- 1887 BARREN, H. E., 46, Lyndhurst Road, Peckham, S.E. *l.*
- 1889 BARRETT, C. G., F.E.S., 39, Linden Grove, Nunhead, S.E. *l.*
- 1889 BEAUMONT, A., F.E.S., 153, Hithergreen Lane, Lewisham,
S.E. *l, c, orn.*
- 1888 BENNETT, W. H., 62, St. Mary's Terrace, West Hill, Hastings.
h, c.
- 1888 BILLUPS, P. C. C., M.D., Rocklands, 179, Friern Road, East
Dulwich, S.E. *mi.*
- 1877 BILLUPS, T. R., F.E.S., 20, Swiss Villas, Coplestone Road,
Peckham, S.E. *h, o, c, d, he.*
- 1886 BLANDFORD, W. F., B.A., F.E.S., 48, Wimpole Street, W. *c.*
- 1873 BOLGER, H. L., Chiselhurst, Kent. *l.*
- 1887 BOUTTELL, C. S., 3, Brownhill Road, Catford, S.E. *l, mi.*
- 1886 BRADY, C., 3, Tanner's End, Edmonton, N.

YEAR OF
ELECTION.

- 1887 BRIGGS, C. A., F.E.S., Surrey House, Leatherhead, Surrey.
l, m, British Fishes.
- 1887 BRIGGS, T. H., M.A., F.E.S., Surrey House, Leatherhead,
Surrey. *l.*
- 1890 BRIGHT, P., Roccabrunna, Bournemouth. *l.*
- 1890 BRISTOWE, B. A., Champion Hill, S.E. *l.*
- 1890 BROWN, E. W., Lieut., 2nd Battalion, Royal West Kent
Regiment, Shorncliffe Camp, Kent. *l.*
- 1890 BRYANT, G., 6, Oakley Crescent, Chelsea, S.W. *l.*
- 1890 BUTLER, W. E., 297, Oxford Road, Reading. *l.*
- 1887 BUTTERFIELD, J., 110, Lewisham Road, S.E.
- 1889 CAMERON, M., 2, Darnley Road, Hackney, N. *l.*
- 1888 CANSDALE, W. D., F.E.S., 40, London Road, Forest Hill,
S.E. *l.*
- 1889 CANT, A., 10, Chandos Street, Cavendish Square, W. *l.*
- 1886 CARPENTER, J. H., Johnson Villa, Gleneagle Road, Streatham,
S.W. *l.*
- 1877 CARRINGTON, J. T., F.L.S., *President*, 145, Strand, W.C. *l, cr.*
- 1890 CHAMPION, G., 37, Boundary Road, St. John's Wood, N.W. *l.*
- 1872 CHAMPION, G. C., F.E.S., 11, Caldervale Road, Elm Park,
Clapham, S.W. *c.*
- 1872 CHANEY, W. C., 32, Stroud Road, Woodside, S. Norwood,
S.E. (*Hon. member*). *h, l, c.*
- 1888 CHITTENDEN, D., Wellesboro' Lees, Ashford, Kent. *l.*
- 1887 CLARK, J. A., F.E.S., The Broadway, London Fields, E. *l.*
- 1890 CLARK, R. A., M.A., Rossall School, Fleetwood, Lancaster. *l.*
- 1888 CLARKE, A. L., 24, Estelle Road, Mansfield Road, Gospel
Oak, N.W. *l, b.*
- 1879 CLODE, W. (*Life member*).
- 1886 COCKERELL, T. D. A., 3, Fairfax Road, Bedford Park,
Chiswick, W. *h, d, m.*
- 1876 COLE, W., F.E.S., 7, Knighton Villas, Buckhurst Hill, Essex.
- 1889 COLLINGS, C. H., 172, Strand, W.C. *h.*
- 1884 COOK, A. E., 31, Lower Road, Rotherhithe, S.E. *l, orn, r.*
- 1884 COOPER, J. A., F.E.S., Sussex Villas, Harrow Road, Leyton-
stone Road, E. *l, orn.*
- 1890 CRANE, P. J., Holly House, Chingford, Essex. *l.*
- 1885 CROKER, A. J., F.E.S., 156, Tennison Road, S. Norwood. *l. c.*
- 1891 DACIE, J. C., Mayfield, 105, Upper Richmond Road, Putney,
S.W. *m, l.*

YEAR OF
ELECTION.

- 1886 DAY, G., 19, Garlick Hill, E.C. *orn, mi.*
- 1888 DAWSON, W. G., Plumstead Common, Plumstead, Kent (*Life member*). *l.*
- 1889 DENCH, G. E., 65, Huddleston Road, Tufnell Park, N. *l.*
- 1889 DENNIS, A. W., 48, Mansfield Street, Kingsland Road, E. *l.*
- 1890 DENNIS, G. C., 11, Tower Street, York. *l.*
- 1890 DOBRÉE-FOX, Rev. E. C., Castle Moreton Vicarage, Tewkesbury. *l.*
- 1884 DOBSON, H. T., Douglas Villa, Acacia Road, New Malden, Surrey. *l, orn.*
- 1884 DOWNING, J. W., F.E.S., 59, Lupus Street, Pimlico, S.W. *l.*
- 1887 DRUCE, H. H., F.E.S., 43, Circus Road, St. John's Wood, N.W.
- 1886 DUNNING, J. W., M.A., F.L.S., F.Z.S., F.E.S., *Patron*, 12, Old Square, Lincoln's Inn, W.C.
- 1886 EDWARDS, S., F.Z.S., F.E.S., Kidbrook Lodge, Blackheath, S.E. *l, e l.*
- 1877 ELISHA, G., F.E.S., 122, Shepherdess Walk, City Road, E. *l.*
- 1886 ENOCK, F., F.E.S., 12, Parolles Road, Upper Holloway, N. *d, mi.*
- 1890 FARINI, G. A., Dartmouth Lodge, Forest Hill, S.E.
- 1889 FARRANT, M., 74, Cambridge Street, Pimlico, S.W. *l.*
- 1887 FARREN, W., 14, King's Parade, Cambridge. *l.*
- 1888 FENN, C., F.E.S., Eversden House, 83, Burnt Ash Hill, S.E. *l.*
- 1888 FENTON, F. E., The Cedars, Ealing.
- 1872 FICKLIN, A., Norbiton, Surrey. *l.*
- 1887 FITCH, E. A., F.L.S., F.E.S., Brick House, Maldon, Essex. *l, c, hy.*
- 1887 FLETCHER, W. H. B., M.A., F.E.S. (*Life member*), Fairlawn House, Worthing, Sussex. *l.*
- 1887 FOWLER, The Rev. Canon, M.A., F.L.S., F.E.S., The School House, Lincoln. *c.*
- 1889 FORD, A., Alexandra Villa, Braybrooke Road, Hastings. *l, c.*
- 1889 FORTUNE, R., Ravensgill, Franklin Mount, Harrogate. *orn.*
- 1886 FREMLIN, H. S., M.R.C.S., L.R.C.P., Mereworth, near Maidstone, Kent. *l.*
- 1886 FROHAWK, F. W., 9, Dornton Road, Balham, S.W. *l.*
- 1890 GARDNER, W., Liverpool. *l.*
- 1889 GERRARD, V., 47, Foulden Road, Stoke Newington, N. *l.*
- 1884 GIBB, L., Heath Bank, Princes Road, Lewisham, S.E. *l.*
- 1886 GIBBS, T., Jun., Brethby, Burton-on-Trent.

YEAR OF
ELECTION.

- 1885 GODWIN, F., 472, Edgware Road, W.
- 1885 GOLDTHWAITE, O. C., Oak Villas, Lea Bridge Road, Leyton. *L.*
- 1888 GOULD, A. E. D., 61, Cornwall Road, Notting Hill, W.
- 1889 GREENE, Rev. J. G., M.A., Rostrevor, Apsley Road, Clifton, Bristol. *L.*
- 1889 GROVER, T., 9, Victoria Street, Westminster.
- 1888 HALL, A. E., F.E.S., Norbury, Sheffield. *L.*
- 1884 HALL, T. W., F.E.S., 7, Princess Road, Selhurst, S. Norwood. *L.*
- 1888 HAWES, F. W., 14, Dovecote Villas, Wood Green, N. *L.*
- 1887 HAYWARD, H., 53, Fenwick Road, Peckham, S.E.
- 1884 HELPS, J. A., Newstead Lodge, 91, Wood Vale, Forest Hill, S.E. *L.*
- 1886 HENDERSON, J., 25, Madeira Road, Streatham, S.W. *L, orn.*
- 1890 HEWK, H., Secretary's Office, Bank of England, E.C. *L.*
- 1887 HICKIN, W. R.,
- 1878 HICKLING, G. H., Landon Cottage, Elm Road, Sidcup. *L.*
- 1890 HILL, ~~H.~~ J., 132, Haverstock Hill, Hampstead, N. *L.*
- 1888 HILLMAN, T. S., Eastgate Street, Lewes, Sussex. *L.*
- 1889 HILLSWORTH, E. H. R., 137, Osborne Road, Forest Gate, E. *L.*
- 1889 HINCHLIFF, Miss K. M., Worlington House, Instow, N. Devon. *L, e L.*
- 1890 HODGES, A. J., 2, Highbury Place, Islington, N. *L.*
- 1887 HOLMES, W. J., 190, Bermondsey Street, S.E.
- 1888 HOPKINS, H. E., 153, Camden Grove, Peckham, S.E. *L.*
- 1889 HORNE, A., 31, Watson Street, Aberdeen. *L.*
- 1889 HOWGRAVE, W., 56, Granville Park, Blackheath, S.E. *L.*
- 1889 HUDSON, T., 8, Berkeley Street, Battersea Park Road, S.W. *L.*
- 1887 INCE, C. E. M., 11, St. Stephen's Avenue, Shepherd's Bush, W. *L, c.*
- 1886 JÄGER, J., 180, Kensington Park Road, Notting Hill, W. *L.*
- 1888 JAPP, A. H., LL.D., The Limes, Elmstead, near Colchester. *orn.*
- 1887 JENNER, J. H. A., F.E.S., 4, East Street, Lewes, Sussex. *L, c, d, m, b.*
- 1884 JOBSON, H., 1, Rock Villas, Maynard Road, Walthamstow, E. *L.*
- 1889 JOHNSON, C. F., 1, Manor Villa, Hamilton Road, Highbury, N. *L.*
- 1887 JOHNSON, Rev. W. F., F.E.S., Winder Terrace, Armagh, Ireland. *L, c.*
- 1886 JOY, E., 15, Brownswood Park, South Hornsey, N. *L.*

YEAR OF
ELECTION.

- 1886 KANE, W. F. DE V., M.A., F.E.S., M.R.I.A., Sloperton Lodge,
Kingstown, Co. Dublin. *l, mi, marine invertebrata.*
- 1888 KATZ, J., 34, Beverley Road, Anerley, S.E. *histology.*
- 1887 KEAYS, A. M., A.S.T.E., M.S.A., Wandle Cottage, Croft Road,
Sutton, Surrey.
- 1887 KEDGLEY, C., Hibernia Chambers, Borough, S.E.
- 1887 KELSALL, J. E., Fareham, Hants. *orn, r.*
- 1884 KENWARD, J., Rosslyn, New Eltham, Kent. *l.*
- 1888 KIMBER, Miss M., Cope Hall, near Newbury, Berks. *l.*
- 1888 KNIGHT, E., 2, Lichfield Grove, Finchley, N.
- 1887 LEA, J., 2, Elm Villas, Elm Row, Heath Street, Hampstead,
N.W. *l.*
- 1887 LEECH, I. H., B.A., F.L.S., F.Z.S., F.E.S., F.R.G.S., 29,
Hyde Park Gate, S.W. *macro-l, etc., of Wallace's palæarctic
region.*
- 1889 LEGROS, A. V., 57, Brook Green, Hammersmith.
- 1889 LEMMON, C. H., Hawkestone Road, Rotherhithe, S.E.
- 1884 LEVETT, C., 104, Malpas Road, Brockley, S.E. *l.*
- 1890 LEWCOCK, G. A., 73, Oxford Road, Islington, N. *c.*
- 1887 LIVESEY, F., 709a, Old Kent Road, S.E.
- 1885 LOWREY, P. F. J., Lyndhurst, 34, Elms Road, Clapham Park,
S.W. *l, orn.*
- 1872 LUBBOCK, The Right Hon. Sir JOHN, Bart., M.P., D.C.L.,
F.R.S., F.L.S., F.G.S., F.E.S., etc., *Patron*, High Elms,
Down, near Farnboro', Kent. *h, b.*
- 1890 McALLAN, R., 3, Ludgate Circus, E.C.
- 1890 McARTHUR, H., 35, Averill Street, Fulham, W. *l.*
- 1889 MACKMURDO, W. G., Aldersbrook, Hermon Hill, Wanstead,
Essex. *l.*
- 1872 M'LACHLAN, R., F.R.S., F.L.S., F.Z.S., F.E.S., *Patron*,
Westview, Clarendon Road, Lewisham, S.E. *n.*
- 1889 M'LACHLAN, W. H., 8, Trouville Road, Clapham Park, S.W. *l.*
- 1886 MANGER, W., 100, Manor Road, New Cross, S.E. *l, c.*
- 1889 MANSBRIDGE, W., Luther Place, Horsforth, near Leeds. *l.*
- 1888 MARSHALL, A., Byfleet, Weybridge. *l.*
- 1888 MARTIN, W., 21, Longley Street, Southwark Park Road, S.E.
- 1886 MATTHEW, Dr. C. M., Wickham Lodge, Trinity Road, Upper
Tooting, S.W. *d.*
- 1888 MATTHEWS, C., F.E.S., Erme Wood, Ivybridge, South Devon.
orn.

YEAR OF
ELECTION.

- 1885 MERA, A. W., 1, Lothian Villas, Capel Road, Forest Gate, E. *l*.
- 1881 MILES, W. H., F.E.S., The New Club, Calcutta, India. *mi, b*.
- 1888 MITCHELL, A. T., 5, Clayton Terrace, Gunnersbury, W.
- 1888 MONTAGUE, C. J., 37, Calabria Road, Highbury, N. *mi*.
- 1880 MONTIERO, SENOR A. DE C., F.E.S., Rua do Alacrine, Lisbon.
- 1889 MOORE, H., 12, Lower Road, Rotherhithe, S.E. *l, h, d, e l, e h, e d, mi*.
- 1887 MORRIS, C. H., School Hill, Lewes, Sussex. *l, c, m*.
- 1889 NEVELL, J. P., 16, Lordship Park, Stoke Newington, N. *l*.
- 1887 NEVINSON, E. B., 7, Staple Inn, W.C. *l, stalk-eyed crustacea*.
- 1889 NICHOLSON, W. E., F.E.S., Lewes, Sussex. *l*.
- 1889 NOTT, A. W., 75, Waterloo Road, S.E. *l*.
- 1886 NUSSEY, B. L., 9, Chester Place, Burrage Road, Plumstead. *l*.
- 1872 OLDHAM, C., 2, Warwick Villas, Chelmsford Road, South Woodford, E. *l*.
- 1888 OSWALD, F., 16, St. Mark's Crescent, N.W. *l*.
- 1890 PEAKE, A. E., Oakfield, St. Nicholas Road, Upper Tooting. *l, c*.
- 1884 PEARCE, A. E., 1, Ildersley Grove, West Dulwich, S.E. *b*.
- 1888 PEARCE, J., 4, Borough High Street, Borough, S.E.
- 1888 PEARCE, J. E. " " " "
- 1883 PEARCE, W. A., Wilkinsburg, Alleghany Co., Penna, U.S.A. *l, b*.
- 1880 PERKINS, V. R., F.E.S., Wotton-under-Edge, Gloucestershire. *l, h, d*.
- 1888 PERKS, F. E., 111, St. Martin's Lane, Charing Cross, W.C. *zoology, mi*.
- 1889 PERRY, J. F., Oscott Cottage, Birmingham. *l, c*.
- 1889 PICKARD-CAMBRIDGE, H. C., 54, Milton Road, Herne Hill, S.E.
- 1888 PODE, E. D. Y., Slade, Ivybridge, S. Devon. *l*.
- 1880 PONSFORD, J. T., Bromley, Kent.
- 1887 PORRITT, G. T., F.L.S., F.E.S., Greenfield House, Huddersfield. *l*.
- 1887 POW, F. E., 43, Choumert Road, Peckham S.E.
- 1886 POWLEY, W., M.A., Whitton Villa, Hounslow.
- 1889 RANDELL, G. J., 6, Haycroft Road, Brixton Hill, S.W.
- 1888 REID, W., Pitcaple, Aberdeen. *l, continental l*.
- 1886 RENDALL, P., M.D., Bathurst, Gambia. *l*.
- 1887 RICE, D. J., *Hon. Librarian*, 22, Methley Street, Kennington, S.E. *orn*.

YEAR OF
ELECTION.

- 1887 ROBERTS, C., 59, Leppoc Road, Clapham Park, S.W. *l*.
- 1889 ROBERTSON, A. J., Gloucester House, Harders Road, Peckham, S.E. *l*.
- 1887 ROBINSON, A., 1, Mitre Court, Temple, E.C. *l*.
- 1888 ROBSON, H., 5, Winterwell Road, Brixton Hill, S.W. *l, b*.
- 1888 ROOTS, W., 208, Gt. Dover Street, Borough, S.E.
- 1890 ROWNTREE, J. H., Scarborough. *l*.
- 1887 ROUTLEDGE, G. B., 50, Russell Square, W.C. *l*.
- 1887 RUSS, P., Culleenamore, Sligo, Ireland. *l*.
- 1890 RUSSELL, S. C. J., 11, Dornton Road, Balham.
- 1890 RYE, B. G., 212, Upper Richmond Road, Putney. *l*.
- 1886 SABINE, E., 22, The Villas, Erith. *l*.
- 1886 SALWEY, R. E., F.E.S., Peace Wold, Radnor Park Road, Folkestone. *l*.
- 1888 SAUZÉ, H. A., 4, Mount Villas, Sydenham Hill Road, S.E. *l*.
- 1886 SHAW, A. E., F.E.S., Wandsworth Dispensary, Wandsworth, S.W. *o*.
- 1886 SHEARWOOD, G. P., Uplands, Belvedere Road, Upper Norwood, S.E. *l*.
- 1886 SHELTON, W. G., 15, Alexandra Road, Croydon. *l*.
- 1888 SHORT, A., 19, Courthorpe Road, S. Hampstead, N. *l*.
- 1890 SINCLAIR COX, E. W., 1, Temple Gardens, E.C.
- 1886 SKINNER, G., 31, Motley Street, Wandsworth Road, S.W. *l*.
- 1887 SMITH, H. J., 36, Lausanne Road, Peckham, S.E.
- 1889 SMITH, J., 67, Upper Whitworth Road, Plumstead, Kent. *l*.
- 1890 SMITH, W., 4, Hill View Place, Paisley. *l*.
- 1882 SOUTH, R., F.E.S., 12, Abbey Gardens, St. John's Wood, N.W. *l*.
- 1886 SPANTON, A. W., Ellerslie, Eltham Road, Lee, S.E. *l*.
- 1872 STAINTON, H. T., F.R.S., F.L.S., F.G.S., F.E.S., etc., *Patron*, Mountsfield, Lewisham, S.E. *l*.
- 1873 STANDEN, R., The White House, Alby, Norfolk (*Life member*). *l*.
- 1872 STEP, E., *Hon. Treasurer*, The Mays, Ladbroke Road, Epsom, Surrey. *b, m, orn*.
- 1888 STEVENS, L., L.C.C., Lower Road, Deptford, S.E.
- 1872 STEVENS, S., F.L.S., F.E.S., Loanda, Beulah Hill, Norwood, S.E. *l*.
- 1886 STOREY, A. T., 10, Woodstock Road, Bedford Park, W.
- 1890 STREET, H. W., 140, Kennington Park Road, S.E. *l*.

YEAR OF
ELECTION.

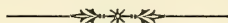
- 1887 STRINGER, J., Bulwer Road, New Barnet. *l*.
- 1889 STRONG, L. W., 14, Lordship Park, N. *l*.
- 1889 STURT, W. T., West House, Queen's Road, Kingston Hill. *l*.
- 1890 THORNEWILL, The Rev. C. F., M.A., Burton-on-Trent. *l*.
- 1889 TINDALL, G.
- 1889 TREWEEKE, F. P., 3, Muschamp Road, Peckham, S.E.
- 1873 TUGWELL, W. H., Ph.C., *Vice-President*, 6, Lewisham Road, Greenwich, S.E. *l, b*.
- 1887 TURNER, H. J., 13, Drakefell Road, St. Catherine's Park, S.E. *l, orn*.
- 1886 TUTT, J. W., F.E.S., Rayleigh Villa, Westcombe Park, Blackheath, S.E. *l*.
- 1888 VAUGHAN, H. W. J., F.E.S., 55, Lincoln's Inn Fields, W.C. *l*.
- 1887 VERRALL, G. H., F.E.S., Sussex Lodge, Newmarket. *d*.
- 1889 VINE, A. C., 38, Temple Street, Brighton, Sussex. *l*.
- 1889 WAINWRIGHT, C. J., Hall Road, Handsworth, near Birmingham. *l*.
- 1880 WALKER, J. J., R.N., F.L.S., F.E.S., 23, Ranelagh Road, Marine Town, Sheerness. *l, c*.
- 1890 WALLACE, G., 42, St. Germain's Road, Forest Hill, S.E. *l*.
- 1888 WALLER, R., 273, Clapham Road, S.W. *l*.
- 1886 WALSINGHAM, The Right Hon. Lord, M.A., F.R.S., F.L.S., F.Z.S., F.E.S., etc., Merton Hall, Thetford, Norfolk. *l, orn*.
- 1890 WARD, A., 118, Richmond Road, Brighton. *l*.
- 1888 WARNE, N. D., 8, Bedford Square, W. *l*.
- 1888 WARNE, W. F., 8, Bedford Square, W. *l*.
- 1888 WARREN, W., M.A., F.E.S., 3, Kempson Road, Walham Green, S.W. *l*.
- 1891 WASHFORD, T. J., Glengarry Road, East Dulwich, S.E.
- 1887 WATERHOUSE, E. A., 23, Spencer Road, Putney, S.W.
- 1886 WATSON, C. H., 37, Tierney Road, Streatham Hill, S.W. *l*.
- 1888 WEBB, S., Folkestone Road, Dover. *l*.
- 1872 WEIR, J. J., F.L.S., F.Z.S., F.E.S., *Vice-President*, Chirbury, Coper's Cope Road, Beckenham, Kent. *l, e l*.
- 1872 WELLMAN, J. R., 8, Medora Road, Brixton Rise, S.W. *l*.
- 1872 WEST, W., *Hon. Curator*, 8, Morden Hill, Lewisham Road, S.E. *l, c*.
- 1878 WEST, W., L.D.S., Cyprus Villa, Lewin Road, Streatham Common, S.W. *l, mi*.
- 1887 WHIFFEN, W. H., 49, Granville Park, Lewisham, S.E. *l*.

YEAR OF
ELECTION.

- 1884 WILKINSON, S. J., 60, Lillieshall Road, Clapham Common,
S.W. *l*.
- 1891 WILLIAMS, H., 30, Hanley Road, Hornsey Rise, N.
- 1872 WILLIAMS, J. T., 5, Woodland Villas, Foot's Cray, Kent. *l*.
- 1886 WINDYBANK, A. J., Fawley Cottage, Hardman's Road,
Kingston-on-Thames. *l*.
- 1888 WINKLEY, M. H., Glen Eldon Road, Coventry Park, Streatham,
S.W. *l*.
- 1889 WINKWORTH, J. T., 22, Wallwood Street, Burdett Road, E. *l*.
- 1886 WRIGHT, W. H., Secretary's Department, Somerset House,
Strand, W.C. *l*.
- 1887 YARDLEY, H. A., 162, Regent Street, W.
- 1888 YOUNG, J. N., 85, FitzWilliam Road, Rotherham. *l*.

Members will greatly oblige by informing the Hon. Sec. of any errors,
additions or alterations in the above addresses and descriptions.

CATALOGUE OF WORKS IN THE LIBRARY.



ACCENTUATED List of the British Lepidoptera, with hints on the derivation of their names.

Algæ, Marine. *See* British Seaweeds, by Gray.

Amazons, The Naturalist on the River, by Bates.

Anemones and Corals, A History of British Sea, by Gosse.

Animals and Plants under Domestication, by Darwin.

Animals, Senses of, by Lubbock.

Annual Report and List of Members, Maidenhead Naturalists' Field Club and Thames Valley Antiquarian Society.

Anthropoid Apes, by Hartmann.

Ants, Bees and Wasps, by Lubbock.

Ants, Bees, Dragonflies, etc., by Bath.

Ants, On the Habits of. *See* Scientific Lectures by Lubbock.

Aquarium, The Freshwater, by Weston.

Araneidæ. *See* Staveley's British Spiders.

Ashmead (W. H.), On the Hymenoptera of Colorado. pp. 47.

BATES (H. W.), The Naturalist on the River Amazons.

Bartlett-Calvert, Catalogo de los Lepidopteros, Chili.

Bath (W. H.), Handbook of Ants, Bees, Dragonflies, Earwigs, Crickets and Flies.

An Illustrated Handbook of British Dragonflies.

Beagle, The Voyage of the, by Darwin.

Bees, British, by Shuckard.

Bees, Catalogue of British, by Smith.

Beetles, British, by Rye.

Beetles (Carnivorous Ground) of British Isles, by Dawson.

Bell (T.), A History of British Quadrupeds, including the Cetacea.

A History of British Reptiles.

A History of the British Stalk-eyed Crustacea.

Bennett (A. W.) and Murray (G.), A Handbook of Cryptogamic Botany.

Birds, Montague's Dictionary of British, by Newman.

Birds, Saunders' Manual of British.

Bird's-nesting and Bird-skinning, by Christy.

Birds of Hampshire and Isle of Wight, by Kelsall. 34 pp.

Birds. *See* Our Summer Migrants, by Harting.

Blake (H. G. O.), Summer, from the Journal of Henry D. Thoreau.

Blowfly, The Anatomy of the, by Lowne.

Botany, A Handbook of Cryptogamic, by Bennett and Murray.

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Brook (G.), *A Revision of the genus Entomobrya, Rond. (Degeeria, Nic.)* pp. 12.

Notes from my Aquarium. pp. 15.

On a new genus of Collembola: *Sinella* allied to *Degeeria*, Nic. pp. 12.

On the rate of development of the Common Shore Crab: pp. 12.

Buckler (W.), Edited by Stainton, *The Larvæ of British Butterflies.*

Butterflies, An Illustrated History of, by Newman.

Butterflies and Moths, A Manual of British, by Stainton.

Butterflies, European, by Kane.

Butterflies of Europe, by Lang. 2 Vols.

Butterflies, The Larvæ of British, by Buckler.

CAMERON (P.), *A Monograph of the British Phytophagous Hymenoptera,* Vols. II. and III.

Catalogue of the first Great National Entomological Exhibition at the Royal Aquarium, 1878.

Champion (G. C.), *Tropical Collecting.* pp. 12.

Chenu (Dr.), *D'Histoire Naturelle Coléoptères.*

Christy (M.) and Newman (E.), *Bird's-nesting and Bird-skinning.*

Claus (Dr. C.), Trans. by Sedgwick and Heathcote—

Elementary Textbook of Zoology. Special Part.

Mollusca to Man.

Cole (W.), *Remarks on a Parasite of Humble Bees.*

Coleman (W. S.), *Our Woodlands, Heaths and Hedges.*

Coleoptera, Handbook of, by Cox.

Coleoptera, Manual of British, by Stephens.

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